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# The Inventive Age

## AND PATENT INDEX.

Twelfth Year.  
No. I.

WASHINGTON, D. C.---JANUARY, 1900.

Single Copies 10 Cents.  
One Dollar a Year.

### U. S. PATENT OFFICE.

#### DIVISION VI.

Chemistry and All Its Complicated Processes.  
Bleaching and Dyeing, Medicines and  
Surgery, Photography and Ex-  
plosives, Preserving.—In-  
teresting Details.

Division VI of the Patent Office concerns itself with the important subject of Chemistry, under which title are grouped all the commercial processes and instruments employed in such apparently diverse subjects as bleaching and dyeing, medicine, sugar and salt, surgery, photography, explosives, and preserving. The chief examiner of the division is Dr. J. B. Littlewood, who has been engaged in the work for twenty years and has been at the head of this Division since 1891. Of especial interest in this class are the inventions in the field of medicine and preserving, so tremendously developed of late years. But few of the prescription mixtures often called "patent medicines" are patented, the protection of a trade-mark being held preferable. The branch of this extensive class that has of late attracted the most attention is the discovery of new synthetic chemical compounds, which include, also, substances such as vanillin, artificial musk, saccharin, and similar substances, while derivatives of coal tar, numerous as they already are, are daily becoming more and more numerous and more and more complex. Most of them receive catchy names bearing little or no relation to their nature or uses.

Prof. W. H. Seaman has charge of the important field of bleaching and dyeing and also of the sub-classes of carbon compounds and vinegar, which belong to the class of chemicals. In dyeing apparatus, the early methods were confined to dipping and to the use of stencil patterns in press dyeing, but the activity in regard to this has resulted of late in some radical changes. The method of applying

dyes in spray by devices resembling atomizers is very ancient, but in 1879 Vaughan obtained patents for saturating with dye an insoluble powder such as sand and applying the colored powder to the fabric by means of an air blast. Some of the earliest patents in the United States were for apparatus whereby a continued circulation of dye through a fabric could be obtained, and there are a number of recent applications of this process which give very superior results. The principal inventions in dyes, however, are in the synthetic carbon compounds, which have already taken the places of some of the old vegetable

entirely to technical readers. Instances are found in the new processes by which the nitrogen of the air is used to manufacture ammonia, and in many of the compounds for rendering wood and other substances non-inflammable and for extinguishing fires with hand grenades, etc. Other advances are found in new processes of purifying water, demanded by the advancing hygienic science of the day. Explosives have advanced in many ways recently, but most of them can be referred to one of two great classes,—smokeless and cocoa powders. In the class of fertilizers many inventions have been lately made looking to the

devices for making and filling capsules, in which can be taken the bitter and nauseous medicines that our ancestors so disliked. Other inventions in surgery, are hypodermic syringes for injecting medicines directly into the system, volatile anaesthetics, and devices for curing diseases of the throat by applying medicated air. Spraying and atomizing instruments have also been greatly improved.

The art of photography, which is allotted to Mr. F. L. Pittmann, has been almost entirely developed within the last twenty years, and the constant appearance of new inventions, shows that the field is by no means

exhausted as yet. Among the more recent devices, which have enabled the American camera fiend to so enjoy himself, are meters for timing exposures, magazine and roll holding devices, and the wonderful kine-tograph for taking moving pictures. The latest triumphs of photography, however, are found in the field of color photography, by which objects can now be reproduced in their natural colors, and in the art of photographic mechanical printing, whereby the art of illustrating has been absolutely revolutionized. In the class of sugar and salt, the advance, through perhaps not so sensational as in some others, has been most marked, and has made possible the wonderful extension of sugar-making. Centrifugal liquid separa-



DIVISION VI, UNITED STATES PATENT OFFICE.

dyes, such as madder, and which will undoubtedly soon displace all of them. The synthetic dyes were at first fugitive, but they have been improved until they are now the most permanent of any, and they always excelled in beauty and purity of color. This field of invention represents the highest skill of the technical chemist and can never be exhausted, as the number of the combinations of the elements is practically infinite.

Prof. F. A. Holton has charge of most of the class of chemicals and of the classes of explosives and fertilizers. In regard to chemicals, the advances recently made appeal almost

disposal of tankage, a kind of slaughter-house waste, so as to render of value this waste product. Precipitation, filtration, and evaporation have all been tried with more or less success, and this material, which once ran into sewers and became a nuisance, is now rendered valuable for fertilizing.

Mr. Robert Herman has charge of an important class, that of surgery, whose wonderful advance is marked not less in practical work than in the new instruments and methods devised for furthering it. One of the most important advances, made altogether within the past twenty years, is in the

tors have been entirely developed within recent years. By them any liquid, containing substances of different densities, such as milk, can be separated into its constituents. Their invention has revolutionized the dairy business.

The necessity for keeping foods without permitting them to spoil or to become dangerous to health has resulted of late years in the invention of a class of devices known as sterilizers. By some of these devices, cans are filled and sealed while bathed in steam, which destroys all germs. Another important sub-class includes the manufacture of what are known





DR. J. B. LITTLEWOOD.

as prepared foods—wherein diastase is added to hasten digestion—and the preparation of rolled or flaked food, which can be cooked much more quickly than the ordinary substances. Mr. C. L. Parker has charge of this class.

Dr. Littlewood is a graduate of the Medical Department of Georgetown University, a veteran of the civil war, and a member of the American Chemical Society. Prof. Seaman graduated from the Law Department of Columbia University, is also a member of the American Chemical Society, and has been for some years the professor of chemistry in the Medical Department of Howard University, while Prof. Holton, a graduate of Cornell, and a member of the American Chemical Society, occupies a like position in the National College of Pharmacy. Mr. Herman is a civil engineer and a graduate of Cornell University. Mr. Parker received the degree of M. S. from Columbia University, Washington, D. C., and was, prior to his appointment in this Office, an instructor in general chemistry in the Corcoran Scientific School of the Columbian University. Mr. Pittman is an expert practical photographer and was educated at Adelphi College, Brooklyn, N. Y.

#### American Exhibits Desired by Japan.

Mr. S. Uchida, Consul of Japan, Bennett Building, New York, writes to the National Association of Manufacturers under date of December 12 as follows: "Under instructions from my home government, I am collecting exhibits for the Tokyo Educational Museum in connection with the High Normal School of Tokyo which is one of our leading educational institutions supported by the government. The classes of articles desired by the Museum are:

- "1. Models and pictures of school buildings.
  - "2. School furniture and utensils.
  - "3. Text books and maps for schools and kindergartens, and specimens for various branches of the sciences.
- "They are not to be purchased on the market, but I am instructed to pay the freight and insurance for the transportation of those articles which are presented to the institution by the manufacturers of this country. The exhibition of the goods at the Museum would be good advertising for the manufacturers and may lead to business in our country. If you will induce the members of your Association who are manufacturers of these articles to exhibit them by presentation to the Museum, your efforts would result in mutual benefit to both exhibitors and the institution.

### IMPORTANT DECISIONS IN COURT OF APPEALS.

DISTRICT OF COLUMBIA.

BECHMAN VS. WOOD. Decided April, 4, 1899.

#### 1. PATENTABILITY—COMMERCIAL SUCCESSFUL MACHINE.

Where a machine turned out satisfactory work, but it was not commercially successful, for the reason that it did not turn out the work with desirable rapidity, *Held* that such device was not so inoperative as to be deficient in patentability.

#### 2. SAME—BROAD ISSUE, TO WHOM PATENTABLE.

Wood, the senior party, filed his application on October 28, 1893. Bechman, the junior party, filed on October, 26 1895. The interference was declared on the broad issue, which was covered by a broad claim made by Bechman when he filed his application. Wood, however, did not make the broad claim until April 29, 1896. The testimony shows that Wood was the first to conceive of the invention and that Bechman did not in any manner reduce it to practice prior to Wood's filing date. *Held*, that if the broad claim is patentable it must belong to the first inventor of the specific machine, if to any one, and that one is Wood. It certainly cannot be allowed to any subsequent inventor of any other specific mechanism.

#### 3. SAME—BROAD ISSUE, NOT PATENTABLE TO EITHER PARTY.

*Held*, further, that the broad claim is not patentable to either party—not to Bechman, because he was not the first to invent an "independent transferring mechanism" in printing machines in the combination described; not to Wood, because he did not make the claim before his rival made the discovery of his own patentable invention.

#### 4. SAME—SAME—ESTOPPEL.

*Held*, further, that it is not competent for Wood, who had failed to make a broad claim and thus left the field open for other specific inventions than his own, to seek to control all such specific inventions by procuring a patent on the broad claim which he did not advance prior to the making thereof by Bechman. If the broad claim could be held to be patentable to Wood, the effect of a patent upon it to him would be unjustly retroactive, for it would sweep within its control all specific inventions in the same field made previously to the time when he made his claim. (Chicago & Northwestern Railway Co. v. Sayles, 15 O. G., 243; 97 U. S., 554, cited.)

#### 5. SAME—SAME—REFUSING TO AWARD PRIORITY.

*Held*, further, that while both parties to the interference are or may be entitled to patents for their respective specific devices neither one of them, is entitled to a patent for the broad claim of the issue, and therefore there should be no judgment of priority of invention to either party with reference to the broad claim.

#### R—HEARING.

BECHMAN VS. WOOD. Opinion on motion for rehearing. Decided December 6, 1899.

#### 1. INTERFERENCE—JURISDICTION OF THE COURT OF APPEALS.

As a general proposition, the power of the Court of Appeals in interference cases is limited to the determination of the question of priority of invention as between the parties to the interference, and neither the question of patentability of the invention nor the propriety of the declaration of interference is open to consideration.

#### 2. SAME—RIGHT OF AMENDING CLAIMS—APPLICANT BROADENING CLAIMS TO COVER DEVICES OF OTHER APPLICANT.

Where an applicant for a patent has restricted himself in the first instance to a narrow claim for a specific device to effect a certain result, and subsequently another applicant comes into the Office with another narrow claim

for another specific device to effect the same result, and thereafter the first applicant broadens his claim into a generic one, so as to cover and dominate all specific devices to effect such result, assuming that their specific devices have actually been invented in the order of their application to the Office, the utmost liberality of amendment will not justify the destruction of the right of the second applicant to his own specific device, and the fact that the second applicant may have been the first to make the broad generic claim and that the first applicant then broadened his claim into generic proportions cannot affect this conclusion.

#### 3. SAME—SAME—SAME.

Where the first applicant was found to be the true, first and original inventor of his own specific device and apparently the first inventor of any device of the kind, and the second applicant was likewise found to be the true first and original inventor of the specific device stated in his application, this being the order of invention, *Held* that the second applicant could not under any principle of law or any theory of justice be allowed the broad claim which would have dominated the invention of his predecessor in the field, and neither could that predecessor be allowed the broad claim, for the reason that he had not advanced it before the arrival of the other party on the field of invention.

#### 4. SAME—SAME—SAME.

*Held*, further, that by making the narrow claim for a specific device in the first instance the first applicant left the field open for all who would make other different devices to accomplish the same purpose, and it would not be right or just that he should, after the invention of such another device by another person, be permitted to go back and broaden his claim so as to sweep this second device within the scope of his own original application, even though the broad claim might properly have been advanced in the beginning, and even though under other circumstances he might have effectively broadened his claim in the course of the prosecution of the application and procured or entitled himself to a patent for such broad claims.

#### 5. SAME—SAME—SAME—INTERVENING RIGHTS—ESTOPPEL.

If an inventor comes to the Patent Office with an application in which he first restricts himself to a narrow claim for a specific device, but which he is entitled by the process of amendment to broaden into a generic claim, and if he does in fact so broaden it, he may entitle himself to a patent for the broad claim, unless in the meantime, the right of some other person has accrued to some other narrow claim for a similar device to effect the same purpose which would be dominated by the broader claim of the first applicant. It is not just that rights which have previously accrued should be overthrown by amendments subsequently made. (Chicago & Northwestern Railway Co. v. Sayles, 97 U. S., 554; 15 O. G., 243, cited.)

#### 6. SAME—SAME—NEITHER PARTY ENTITLED TO BROAD ISSUE—NEITHER PARTY AWARDED PRIORITY OF INVENTION.

Neither party to this interference is entitled to prevail against the other on the broad claim of the issue, the first being estopped from setting it up against the second applicant in consequence of the intervening rights of the latter to his own specific device, and the second applicant being precluded from having the benefit of it for the reason that he was not the first on the field of invention.

#### 7. SAME—FORMER DECISION ADHERED TO.

The former decision holding that as Wood did not advance the broad claim of the issue until after Bechman had filed his application therefor he is not entitled to a judgment of priority for such broad claim, and that neither party is entitled to a judgment of priority of invention or to a patent for the broad issue is adhered to.

### RECENTLY PATENTED INVENTIONS AND DESIGNS

Procured through the Patent  
Soliciting Department of E. G. SIGGERS.  
Washington, D. C.

Benhof E. Benhardus, Colfax, N. Dak. Musical Instrument.—This invention relates particularly to roller organs and provides new and simple means for communicating motion from the keys to the reed-box valves, also means whereby the roller may be easily and quickly mounted and dismounted for the purpose of changing when so desired. Efficient means are also provided for shifting the roller to vary the composition, as well as mechanism for regulating the volume of sound. These are provided for in the most practical manner possible, and present many advantages over the ordinary instruments of this character.

Frank McDonough, Eau Claire, Wis. Feed Works for Re-Sawing Machines. The invention contemplates an improved construction of feed works rendering it possible to quarter saw lumber either on a band re-saw or a circular re-saw, which operation has not been possible heretofore in connection with the feed works of an ordinary resawing machine. While the invention has for a special object provision for feeding quarter logs to a re-saw and thereby carry out the operation of quarter sawing, it also contemplates an improved construction which renders the feed works convertible for different kinds of sawing, such as for sawing flitches, for center or cant sawing, or for sawing cants. In the accomplishment of these several objects, the feed works contemplated by the present invention are capable of a wide range of use so as to be adapted for practically all kinds of sawing that can be done in connection with a re-sawing machine.

Andrew D. Groom, Glenora, Pa. Automatic Drill.—The present invention provides an efficient and positive mechanism for automatic screw-feed drills, that makes the machinery entirely automatic in both the feed and return movements of the drill spindle, while at the same time insuring a quick-return movement of the spindle when the latter reaches the limit of its movement. While it is particularly intended for hand machines, it may be used to great advantage on almost any style of power drills.

Henry E. and William B. Hassenplug, Rochester, Ind. Grain Drill.—This is a great improvement in this line of invention. It provides simple and efficient means whereby the drill teeth are supported immediately adjacent to the axle of the machine, thereby taking the weight from the necks of the draft animals. Means are also provided for shifting the teeth into a straight row or into staggered relation, thus adapting it for work upon ground either rough or smooth.

Page A. Latham, Gainesville, Ga. Window Blind.—The invention lies in constructing a flexible blind in such a manner as to provide an effective screen for the window, while at the same time permitting a free circulation of air there-through. It consists in making the blinds in separate sections which are separably connected together, so that the lower part of the window may be closed and the upper part open to admit light or air. It is an invention that will be greatly appreciated.

Henry Makinen, Ashtabula, Ohio. Table.—This is a folding table adapted especially for paper hangers, and is of peculiar and advantageous construction whereby when folded it forms a convenient receptacle for materials and



tools. A further advantage lies in the fact that it is capable of being arranged to suit the size of the room to be papered.

Max M. Wald, Madison, Wisconsin. Handle for Wash Boilers, etc.—This is one of the most simple and useful inventions recently patented. The device not only forms a brace and attaching means for the handle, but it also provides means whereby the boiler or other receptacle when applied to the edge of a wash tub, will be self-supporting as to one end, enabling the operator to deposit the contents into the tub without the liability of the boiler slipping off the edge in either direction.

William S. Middlebrook, Middlesex, New York. Berry Cleaning Machine. The machine not only thoroughly cleans berries, but also separates them into various grades, thus making a very useful machine. The invention comprises novel mechanism for cleaning the berries by an air blast and also means for distributing or feeding the bulk evenly to the grading mechanism.

William S. Morris, Bartow, Florida. Tree Protector.—A canvas bag or envelope having hoops to hold it in proper position is arranged in a collapsed position over the tree and then released to allow it to unfold and fall around the tree and completely cover the same. A suitable support is arranged to relieve the tree of the weight. By this means an efficient device is constructed that will thoroughly protect a tree or plant from cold, heat or moisture.

George Scarfe, Towanda, Pa. Thermostat Valve.—A controlling valve is arranged in the supply pipe of steam or other fluid heating systems and has connected therewith very simple automatic mechanism whereby, when the temperature of a room or building reaches a predetermined point the valve will be automatically operated and reduce or cut off the supply, or when the temperature falls below the limit, the valve will be automatically opened. This is a very useful invention which can be used in a great number of ways.

James M. Welch, Looneyville, W. Va. Hand Corn Planter.—This is a planter that is carried by the operator and so arranged that the seed may be planted at any desired distance apart, and besides providing a new and improved construction of the several parts, it is so arranged that different kinds of seeds may be planted simultaneously or along with the fertilizer.

Sam Harbison, Knoxville, Tenn. Design for Trace Fastener Spring.—A flat spring having a U-shaped bend is fastened on the end of the whiffletree, and is arranged to enter the eye of the trace with the whiffletree. By this simple arrangement, the trace or tug is locked to the whiffletree and cannot be accidentally detached.

August R. Anderson, Cameron, Idaho. Churn.—This is an improvement in the rotary dasher churn. It comprises two dashers which are arranged to rotate in opposite directions. The construction is such that the inner dasher may be thrown out of gear to allow the outer one to collect the butter at the center. The mounting of the operating parts is new, as is also an improved strainer arranged in the cover, and the whole device is efficient and inexpensive.

Tollef Herberg, Hendrum, Minn. Horse Shoeing Stall.—A portable rack adapted to be folded and occupy but little space, but when set up will securely hold a horse while being shod, forms the subject of this invention. It consists of a plurality of uprights held in position by suitable fastenings, and a breast-pole across the front of the

same. The animal to be shod, is placed between these uprights and is held against any movement by hitching suitable straps.

Charles W. Kauffman, Deadwood, S. Dak. Handle for Wheelbarrow.—This is a very useful invention, especially intended for mines or excavations where the room is limited. It consists in having the handles of the wheelbarrow hinged so that they may be folded against the body portion and thus be out of the way when not in use. Suitable locking devices hold them out when in operative position. By this means a wheelbarrow can be loaded in a comparatively small space, without the handle being in the way of the workman.

John Ljung, Nelson, Minn. Shingle Nailing Machine.—While this machine is primarily intended for feeding nails to the proper point of application, in fastening shingles to roofs, it may be used with equal advantage in different arts. The device includes in its construction nail-supplying means and a device for carrying a nail bodily from the same to the proper position where it may be struck by a hammer, hatchet or like implement. The many advantages of the machine will be highly appreciated.

Robert J. Fisher, Athens, Tenn. Skirt Hook.—This is a very simple and effective device that is finding great favor. It consists of a flat metal plate provided with two rows of engaging teeth, one row projecting in one direction from one face of the plate, and the other row extending in the contrary direction from the reverse face of the plate, whereby on the application of the device between a waist and the waist-band of a skirt, one row of teeth engage with the waist and the other row engage with the skirt band, and the two are held securely together.

David V. T. Hubbard, Atlanta, Ga. Plow Handle Brace.—A flat metal plate is fastened on the top of the plow beam and has two arms that project on each side and are fastened to the two handles respectively. By this simple means the handles are firmly and rigidly secured to the beams without adding any appreciable weight to the plow.

J. F. W. Kuehn and Paul Wohlfahrt, San Antonio, Texas. Well Drilling Tool Joint.—This invention relates to a simple device for connecting the thread box and pin of a drilling-tool so that there will be no lost motion during operation. A coupling is arranged to fit over the joint and can be readily attached or detached, to allow the members to be taken apart, but when in position retains them in operative relation.

Wilbur Mayes, Omaha, Nebraska. R. R. Signal System.—An automatic block signal is arranged by means of which when two trains are approaching each other on a single track and come within a predetermined limit of safe and proper separation, the first train to enter the block system will set in motion certain mechanism, which, when acted on by the second train entering the same block will complete an electric circuit and give timely warning to each train of the approach of the other. This system being entirely automatic, will do away with the accidents now so common, and so often due to the carelessness of the railroad employees.

Herbert P. Smith, Lime Springs, Iowa. Broom Moistener.—A water reservoir having a series of perforations at its lower end, is held upon the broom head by a pair of spring clamping jaws. The water percolates through the perforations on to the broom head, thereby keeping the latter moistened. By this means a room may be swept without raising any dust

and without the necessity of first sprinkling the floor with damp sawdust or water.

William M. Sweet, Lakefield, Minn. Bicycle-Brake, Bell and Handle.—This is an absolutely unique as well as useful invention. It combines with the handle bar a brake mechanism which can be instantly set by pressure upon the grips in a proper direction, and a bell so arranged that the movement of the handle bar to set the brake will automatically give warning. The handle bar is adjustable to suit the rider's convenience and the whole combination is a distinct departure in the art.

Fred D. Williams, Cooperstown, N. Dak. Hoe.—The invention consists in a three-armed head, a V-shaped central blade secured to the middle arm, and side blades secured to the other arms. These blades are arranged in a horizontal plane and the whole construction forms a cheap but substantial device which will efficiently cut the roots of weeds below the surface without clogging the blades of the implement.

George T. Brown, Freeland, Penn. Cyclometer.—This is a very simple and efficient device which is so arranged that it can be applied to the wheel of a wagon or like vehicle, and will accurately measure and record the exact distance traversed by such vehicle. It is constructed so that it can not be tampered with, and is unaffected by the backward rotation of the wheel. The device is inexpensive, and will be found especially indispensable to livery men or persons who hire vehicles to the public.

Wallace Cloud, Marshfield, Missouri. Flood Fence.—A gate arranged to have a vertical movement by means of a weighted lever is normally held by suitable means across the bed of a stream, and thereby prevent cattle from passing from one field to another. When the stream becomes swollen, the press of water automatically releases the gate, which automatically rises above the stream and allows the water and debris to pass, thus preventing the backing up of the water and subsequent damage to adjoining property.

Jennings Comrie, Milwaukee, Wis. Glove.—New means are provided for attaching the thumb to the palm section. It consists substantially in making the thumb opening of figure-8 shape, inserting the thumb piece therein and stitching the two together. The peculiar configuration makes a rein-

forcement entirely around the thumb-piece, thus making a very strong joint and not only makes a perfect fit without raised seams, etc., but is a simple and inexpensive construction for driving or working gloves.

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# *Inventive Age*

## AND PATENT INDEX.

Established 1889.

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WASHINGTON, JANUARY, 1900.

From ore obtained at Bell Isle, Conception bay, Newfoundland, a vast plant at Sydney, Cape Breton, is to make iron in the near future, it is said, in phenomenal quantities. Boston parties are financing the works. The advantage of the location is that it has the raw material of all sorts near at hand in unlimited abundance, much in the same way as Birmingham, Ala.

Tarlton H. Bean, in charge of the lumber exhibit at the French exhibition, is looking for somebody who will send a novelty woodworking machine. He wants one of those machines that work up the soft timber in Maine and Michigan. It is said that if you put a basswood log in at one end it will come out at the other in the form of tooth-picks, checkers, berry baskets and all sorts of other curious articles and utensils. Any manufacturer of such machinery should communicate with Mr. Bean at the headquarters of the exposition in the Auditorium building at Chicago.

The Chicago Union Traction Company in the near future is to inaugurate a buffet service on street cars. The arrangement will be similar to that between the Pullman Company and the railroads. The cars will be run at stated intervals, always as trailers, and will be conducted as well as any transcontinental dining car. Besides coffee and luncheon, cigars and liquors will be obtainable. An extra fare of five cents will be charged for the privilege of riding on the buffet. The system will enable suburban residents to leave home a little later in the morning and eat their breakfasts on the way down town.

The South has invaded the East with its cotton cloth and pig iron, and now it is affirmed that the West is even selling in New England manufactured articles that New England used to supply to the West. "The fact is," says the Chicago Record, "that the South and West are after New England's long-established manufacturing supremacy and are capturing the prize." Among the New

England products mentioned as displaced by Western products are road wagons, stoves, clothes wringers, washing machines, vials of peppermint, hops and shoes. Western drummers now take in New England when seeking orders for "Yankee notions."

According to the America Lumberman's annual review the stock of white pine lumber in the country continues to decrease rapidly. The stock is now 2,278 million feet, a decrease of 766 million feet from that of last year, while the present stock of white pine is the smallest since 1890 and the white pine resources of the country are over 25 per cent less than they were at that time. This means an annual shortage of 2,000 million feet which must be filled by the substitution of Georgia yellow pine. The whole remaining area of white pine forests will probably be practically denuded within five years and by that time the areas of Southern pine will also be greatly reduced and the white pine industry will have gone the way of the whaling and sealing industries.

The United States is fast overtaking Great Britain in the world's export trade. Completed figures for 1899 show that the older country is still a little ahead, but the younger has gained tremendously in domestic exports from the United Kingdom, in 1899, and according to official reports received by the Treasury Bureau of Statistics, they were \$1,287,971,000, while those from the United States were \$1,253,486,000, making a difference of 34 million dollars in favor of the United Kingdom in the year's exportation of domestic products. In 1875, however, the exports of domestic merchandise from the United Kingdom were \$1,087,497,000, against \$497,263,737 from the United States, her excess over the United States at that time being \$590,233,000.

#### BECHMAN vs. WOOD.

In another column of this issue we print the syllabus of two opinions by Mr. Justice Morris in rendering the decision of the Court of Appeals of the District of Columbia in the case of *Bechman vs. Wood*. The case has already attracted wide attention, and is destined to be made the subject of a fruitful source of contention and speculation for some time to come. An examination of the two opinions shows clearly that the sweeping scope of the first opinion was materially modified in submitting the later opinion, yet many objectionable features remain to embarrass the Patent Office in its work. When the case was re-heard, the Patent office through W. A. Megrath, its Law Clerk, submitted a brief, in opposition to the first opinion, the argument being made that the decision tends to overthrow a long established practice of the Office and greatly restricted the right of amendment. The practice was thus stated in the brief of Mr. Megrath:

"It has been the long-established practice of the Office in declaring an interference between two or more applications showing distinctive and independent species of the same class of inventions, where only one of the applications contained a generic claim which dominated the specific claims of the other application, to make the

generic claim the issue of the interference, and to put the specific claims under the broad issue.

As stated, the Court in its last opinion modified many of the harsh features of the first, but matters are still left in an unsatisfactory state. From the fact that no change has been made in the Rules of Practice of the Patent office, which are affected by the decision, and from matters within our knowledge, we hazard the prediction that the rules will not be changed unless the decision is affirmed by the Supreme Court of the United States. We understand that steps will soon be taken to bring the subject to the attention of the court of last resort. So much interested are the profession, that several prominent patent lawyers have offered to take up any case involving the same state of facts, for a nominal fee, as attorneys are fully alive to the importance of a correct decision on the issues involved. It is creditable to the profession that few attorneys have seen fit to take advantage of what is really a very embarrassing situation, notwithstanding the fact that there are many adjudicated cases affected by the decision.

"To err is human" and judges are mortal and fallible, and while we have always had occasion to commend the able opinions of the Court of Appeals of this District, we believe that in this instance the learned tribunal reached a wrong conclusion. If interference contests are not to descend to farcical proceedings, it will require the maintenance of the present practice, which is the outgrowth of many years of experience, and to accomplish this, the decision must not be allowed to stand as the final settlement of the questions raised by it.

#### Intentions Wanted.

Some years ago a well-known patent attorney, who has since been disbarred from practice before the Patent Office, inaugurated the plan of compiling "Lists of Inventions Wanted," and some of the lists included one thousand inventions. The plan proving profitable, other so-called attorneys caught the fever, and many were the lists sent out to delude inventors with the thought that manufacturers and capitalists were actually demanding the construction of inventions named in the lists. There is scarcely a doubt that, in many lines of industry, inventions are wanted, for "improvement is the order of the day," but the objectionable feature of the prepared lists was that they recited inventions which had already been patented, and in some instances, had become public property by the expiration of the patents.

Disclaiming any desire to return to this practice, we have, however, come into possession of information which leads us to believe that there is a real want, felt in certain circles, for the following named inventions:

First. A shoe or boot for monkeys—must be cheap to be within the reach of the pocket of the ordinary organ-grinder. The writer knows of an instance where the possession of a proper covering for the feet of a monkey would have saved its owner a five dollar fine.

Second. A rat-trap that is sure to

kill. The traps now patented and on the market are apt to maim the rodent and not kill him instantaneously. To comply with up-to-date humane laws no animal should be allowed to suffer unnecessarily, and owners of the present type of "barbarous" traps are likely to get into trouble through the zeal of self-constituted agents.

Third. An anti-crack barn to protect stock from the debilitating effects of draughts. We are informed that a bonus has been offered for this invention.

Fourth. A device to keep clerks from smiling. This is a long-felt want. It will benefit both the clerks and the employer. Many a poor clerk has lost her position by a pre-disposition to "smile."

Fifth. An apparatus to "railroad" cases through the Patent Office in six weeks. The prime object of this is to enable the attorney to collect his fee with the least possible trouble and delay.

We have no axes to grind, and no suggestions to offer, but we confidently rely on the ingenuity of the American inventor to come to the rescue and fill these "wants" before the close of the Nineteenth Century.

#### New Publications.

The Electrical Review, New York city, begins the new year with a special double number which is remarkable for its valuable contributions, handsome illustrations and typography. A new dress of type, a change in the color of the cover and a more up-to-date arrangement of reading pages are some of the improvements made. The contents include a review of electrical progress during 1899 in the United States, Great Britain and the continental countries of Europe; the first installment of an interesting series of articles on the electrical collections at the Smithsonian Institute and the National Museum in Washington, D. C.; "A New Military Telephone," by Captain John P. Wisser, U. S. A.; "Quantity Discharges of Electricity," by Professor John Trowbridge, of Harvard University; "The Energy of Telephone Currents," by E. W. Caldwell; several illustrated articles descriptive of typical central lighting plants, and the current news of the day in electrical circles. Its leading editorial is entitled "Is Transatlantic Wireless Telegraphy Possible?" The Electrical Review has begun its nineteenth year of publication most auspiciously.

Patents and How to Make Money out of Them by W. B. Hutchinson.—D. Van Nostrand Company, 23 Murray Street, New York City.

Under this title a very interesting little book has been recently published. It treats chiefly of the business side of inventions and for this reason occupies a field peculiarly its own. Its author has proceeded on the idea that a little honest and reliable advice as to how to invent, to patent, to introduce, to sell and to protect an invention will be appreciated by all who have, or are likely to have, business in this line. Many inventors through ignorance of the nature of patents and the proper mode of procedure, fall into the hands of incompetent and unscrupulous agents, and fail to secure that to which the law entitles them and so see a competency slip from their hands. This result is largely due to the anxiety of the solicitor to railroad the case through the Patent office on schedule time to claim a small fee. The book is a practical guide for inventors, manufacturers, lawyers and business men generally who have anything to do with patents, and deserves a wide circulation.



## THE BUFFALO FAIR.

A Description of Its Grounds, Paths, Fountains and Immense Buildings.

The Directors of the Pan American exposition at Buffalo this year, otherwise known as the Buffalo fair, are preparing to do their best to throw the Paris effort completely into the shade. Whether they succeed in doing this or not, the fair will undoubtedly present a wonderful exhibit of life, products and achievements, and will also be full of that interest which attracts big excursions and sends people home satisfied. So far it has progressed well. It has an appropriation of half-a-million from the United States government; it has three hundred thousand dollars more from the State of New York; it has between one and two million dollars subscribed by the people of Buffalo, and its other resources will increase the sum to millions more. The fact that Buffalo itself subscribed a half-million dollars in a single day shows that home enthusiasm will not be lacking.

For Director-General it has secured William I. Buchanan, former U. S.

lican Administration until the importunities of the management of the Pan-American Exposition became so strong that he was persuaded to resign and accept the position of director general of the great exposition.

The site of the fair consists of three hundred and fifty acres only three miles from the business centre of Buffalo, with one of the most beautiful interior lakes in the country. Eight of the leading architects of the United States have charge of the architecture.

The style is the free Renaissance, which lends itself admirably to color effects, and which, while not producing the indescribable whiteness of the Chicago fair, will reach an effect that will be peculiarly artistic and satisfactory. Indeed, the managers of the fair are already claiming a group of exposition buildings never before equaled in beauty and attractiveness, and that they will be visited by millions of people. These are the usual large expectations, but Buffalo says proudly that her exposition will be within a day's journey of over forty millions of people, and Mr. Edwin Fleming, the secretary, does not hesitate to predict that 20,000,000 persons will be admitted to the show before it is over. One feature of tremendous interest in this

hollow square, along the front of which a gallery extends. The edifice, a single story high, is raised a few feet above the ground. In the interior is a court adorned by a fountain and planted with trees. For the erection of the building large beams were transported from the mountains and the Indians taught to burn lime, cut stone and make brick and tile."

Briefly stated, the Machinery and Transportation buildings form a hollow square, with arcades on all sides. In the interior is a court 100 feet wide by 200 long, reached by two magnificent entrances from the Great Canal and the Court of Fountains. To one side lies the chief exhibition room of the building and to the other are two exhibition rooms with another great entrance between them. Along each side of the court, extending its entire length, are roof-covered arcades under which the visitor may find rest on comfortable benches.

The pool itself is 175 feet long and 27 feet wide. It is placed in the center of the Court, framed in banks of verdure set with bright colored flowers, which are reflected in brilliant beauty from the quiet waters. The fountain is in the center of the pool, giving life to the scene and freshness to the atmosphere. Throughout the Court

loggias, balconies, pavilions and other places are to be ornamented with shrubs, vines and flowers, blending with the coloring of the building. The openings are grided with specimens of wrought iron "Rejas" or grill screens, such as are seen in examples of Spanish architecture of the sixteenth century.

The building has numerous entrances, the principal ones being in the center of the four facades. Once inside the structure, the size will be appreciated. All the towers, pavilions and other proper spaces are to be brilliantly illuminated and made gay with banners and flags.

All America will take part in the show. Assurance have already been given by the representatives of Canada, Mexico, the Central and South American Republics, and most of the States of the United States, that these countries and States will make unique, interesting and instructive exhibits peculiarly illustrative of their material progress during the century about to close.

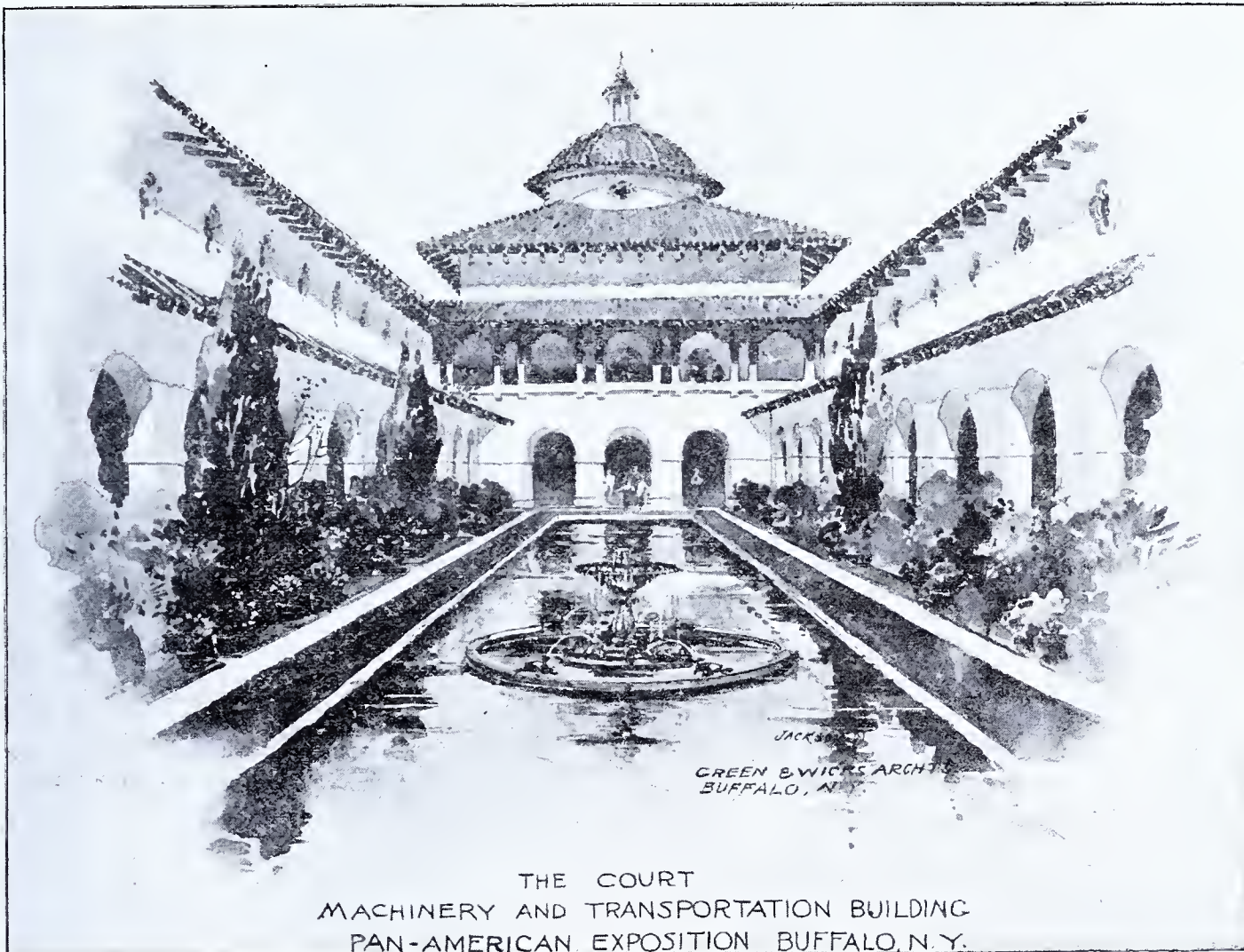
### German Echoes of the Commercial Exposition at Philadelphia.

When, a few months ago, the prospectus and plans for the National Export Exposition of the Philadelphia Commercial Museum were circulated in Germany, they were generally received with either indifference or ill-concealed resentment. The invitations which were extended to European delegates, offering the hospitality of the exhibition and an opportunity to participate in its proceedings, did something, but not much, to allay the general suspicion that the whole enterprise was simply a scheme to foster American export trade at the expense of rival manufacturing nations in Europe. The debates in German chambers of commerce over the question of accepting or declining that invitation were mainly a rehearsal of the grievances of German exporters against the tariff, the Treasury and custom-house regulations, the too alert and searching activities of the United States consuls, and the defects in American merchandise. A memorable feature of that period was the reputation suddenly won by a member of the chamber of commerce at Cologne, through a specially tart and sarcastic letter, which he had sent to Director Wilson in declining his invitation to attend the exposition as a delegate. There were not wanting business men and influential newspapers which took a broader, more liberal view of the case, and, as the expression of their judgment, a delegation, limited as to numbers, but of the highest ability and efficiency, was sent to represent German interests at the exposition. These delegates, most of whom made extensive journeys through the Southern, Western, and New England States, where they examined the principal industries of each section, have now returned and have, through newspaper interviews, lectured before boards of trade and various industrial associations, disseminated a vast amount of fresh and original information concerning the United States.

The effect of these reports—attended as they have been by the Samoan agreement and the Executive suggestions of a joint commission to study with scientific thoroughness certain questions which are now more or less at issue between the two countries—has been to change suddenly and to a surprising degree the tenor of newspaper comment and popular feeling toward the United States.

While the reports and lectures of the returned delegates deal with a wide range of subjects, which they have studied from somewhat different standpoints, there are certain conclusions concerning which they all agree. Among these is the judgment that the commercial exposition has been unex-

(Continued on page 9.)



THE COURT  
MACHINERY AND TRANSPORTATION BUILDING  
PAN-AMERICAN EXPOSITION BUFFALO, N. Y.  
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minister to the Argentine Republic and a gentleman of great experience and high executive ability. Mr. Buchanan, who is in the prime of vigorous manhood, first came into prominence in exposition circles when he organized the Sioux City Corn Palace Exposition Company, and the great success made on that occasion caused the management of the World's Columbian Exposition to proffer Mr. Buchanan the position of superintendent of the agricultural department of the great Chicago Fair. In that position Mr. Buchanan did marvelous work, and at the close of the fair he was offered the post of Minister to Argentina by President Cleveland. When the Administration changed Mr. Buchanan had so ingratiated himself with the leading men of that country that a special request was made to President McKinley for Mr. Buchanan's retention, and he was allowed to remain undisturbed under a Repub-

exposition is the fact that its machinery will be run by Niagara Falls, and its electric splendors are expected to out-dazzle anything in the history of the world. The cataract is only a half-hour away, and of course the excursion tickets will include both the show and the Falls.

All the usual buildings will be found on the grounds as well as many others never seen at a fair before. Perhaps the finest structure of all will be the great Machinery and Transportation building, a cut of which is herewith presented. It is 500 by 350 feet, and is built in the style of the Spanish Renaissance, with initial inspiration in the mission buildings found in Mexico and California, supplemented by later examinations of Renaissance work in Spain, modified to suit the conditions of the Exposition with its gay and festive surroundings.

An early visitor writes: "The mission building is in the form of a

are pleasant walks and paths, bordered with low-growing shrubbery and plants at axis-points with the arcades, rare plants bloom in vases, giving a landscape effect to the scene. The entire spot has the restful atmosphere of a mission cloister and is planned as one of the many little places wherein the weary sightseer may rest both body and brain.

The building itself is very attractive. The roofs are of red tile, the walls of cement, the work ornamented, and the structure covered with glowing colors. The faces present an arcaded effect, cool, pleasing and inviting; the eaves with their great overhangs add to its picturesqueness. Each facade is broken by an important architectural feature, and each corner flanked with low pavilions, the design giving large plain surfaces for color, while the eaves give deep shadows. The color scheme is made up in reds and yellows, light in tint. The



# PATENTS

ISSUED DECEMBER 19, 1899.

A full printed copy of drawings and specifications of any Patent in this list will be sent on receipt of 10 cents in postage stamps. Preserve this list for future reference and always send name, title of invention and date of issue.

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Washington, D. C.

Advertising and display card. H. P. Kaufman  
Advertising apparatus. F. C. Morton  
Air compressor, automatic. G. E. Drum  
Air purifying apparatus. S. Bangs et al  
Alloy, Aluminium. W. A. McAdams  
Amusement apparatus. G. T. Woods  
Animal trap. S. R. Kagarier  
Animal trap. J. B. Stout  
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Assembling machine. L. L. Harris  
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Automobile. T. R. Almond  
Bag holder. A. Rippon et al  
Bale band fastener. D. M. Campbell  
Bale cotton press, cylindrical. L. Anderson  
Bale tie machine. 2 pats. E. M. Touseley  
Bandage, suspensory. G. A. Mattern  
Barrel handling device. W. C. Day  
Bed. M. P. Henderson  
Bed and attachment, spring. 5 pats. J. F. Gail  
Bell striking mechanism. F. A. Scranton  
Belt fasteners, making. W. H. Bristol et al  
Bending machine. H. C. Filstrup et al  
Bicycle. H. F. Henderson  
Bicycle attachment. S. H. Law  
Bicycle brake. J. La Burt  
Bicycle brake and coaster. W. Morris  
Bicycle chain. C. B. Holmes  
Bicycle driving mechanism. R. F. Robinson  
Bicycle frame device. J. S. Copeland  
Bicycle pedal. J. F. Stauffer  
Bicycle rack and locking device. C. Butcher  
Billiard-cue chalk holder. C. A. McLarty et al  
Binder, temporary. W. M. Russell  
Boiler. B. Holt  
Book covering. W. H. Smalley  
Book holder. T. J. Gary  
Book, indexed. A. L. Yates  
Book rest, adjustable. C. W. Davis et al  
Boring machine. C. Nielson  
Bottle, non-refillable. L. T. M. Canada  
Bottle, non-refillable. W. I. F. Harden  
Bottle, non-refillable. C. J. Nesbitt  
Bottle stopper. H. Y. Bready  
Bottle stopper. H. S. Brewington  
Bottle washing apparatus. C. Groterjan  
Bottle wrappers, making. C. G. Biedinger  
Box filling, covering machine. W. H. Butler  
Brake shoe key. C. G. Eutis  
Bridge girder or beam. A. Vierendeel  
Brush. E. N. Broderick  
Brush. C. L. Goshing  
Brush, rotary. A. T. Condon et al  
Bung, carbonic. C. Lejeune  
Button-setting machine. F. E. Stanley et al  
Button, upholstering. W. Consoer  
Buttner. G. F. Salisbury  
Cabinet, paper. J. T. Hoyt  
Cables, apparatus for holding. J. Carpenter  
Caliper attachment. B. M. W. Hanson  
Calipers and valve-setter. I. R. Kern  
Can holder and protector. C. J. Abbe  
Cane mill. R. K. Roberts  
Car brake. H. S. Goughnour  
Car brake. J. Lyker  
Car brake adjuster. C. V. Rote  
Car center plate. C. F. Street  
Car coupling. C. D. Horgan  
Car coupling. F. H. Wendt  
Car fender. W. Jackson  
Car grain door, freight. E. W. Morten  
Car, railway. A. A. Amiotte  
Car, railway. J. M. Jones  
Car roof. D. Watson  
Car bearing antifriction. J. E. Norwood  
Carbonating apparatus. 3 pats. L. Tuft et al  
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Carriage, baby. S. McGaughey  
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Disintegrator. E. Creiss  
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Dress shield pocket for garments. M. Jacks  
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Elevator and conveyor. E. C. Berghoefer  
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Filtering tunnel. W. S. Keene  
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Firearm safety device. G. Luger  
Fire-escape. M. H. Dooly  
Fire-escape. J. Spaulding  
Fire-escape. E. Winston  
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Fireworks body or the like. L. Nordlinger  
Fish hook. H. S. Bntz  
Fishing hook keeper, snood. J. Smith  
Floor surfacing machine. F. R. Patch  
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Folding gate. J. S. P. Kinman  
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Garbage crematory. M. J. Cragin  
Garment. C. Rutenberg  
Garment supporters. F. C. Raymond  
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Gas engine. A. H. Neale  
Gas generator, acetylene. P. Busher  
Gas motor regulating valve. M. E. Hertel  
Gas valve, self closing. J. Blevins  
Gas recording instrument. A. Steinbart  
Gate. T. Ferguson et al  
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Governor mechanism. R. Shirreffs  
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Heater. J. R. Froberg  
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Heel. F. Wiesen  
Hem folding machine. R. Loeb  
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Hinge, spring. J. Lehnbeuter  
Horse breaking apparatus. J. Craig  
Horseshoe calk. G. B. Brooks  
Horseshoe calk sharpener. H. I. Stanley  
Horseshoe, nailless. D. Kerekes  
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Hot air furnace. W. H. Hillyer  
Hot air furnace. J. Timms  
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Incandescent mantle. 3 pats. J. H. Abercrombie  
Ingots, billets, handling. J. J. McNeil  
Iron and steel, planished. W. C. Dickey  
Iron or steel, phosphoric. S. P. Etter  
Ironing board and ladder. L. Nelson  
Jar fastener. R. H. Hansee  
Joint for hollow tubes, &c. J. Hickson et al  
Journal bearing, lubricating. B. J. Knapp  
Journal box. J. W. Wheaton  
Label holder for bottles. E. L. Brown  
Labeling machine. C. F. Tebbetts  
Ladder shelf attachment. F. K. Randall  
Ladder, step. J. D. Hall  
Lamp, acetylene gas. H. Riemann  
Lamp, central draft. C. S. Miller  
Last for making overshoes. C. S. Bronson et al  
Last hinging machine. E. A. Easton  
Latch. C. Brown  
Lath, spoke. L. G. Robinson  
Lead oxide, making. W. E. S. Bunn et al  
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Ledger, detachable leaf. E. Marsky  
Lid and card holder. R. H. Suettinger  
Linter. M. Swenson  
Liquid dispensing can. C. M. Husted  
Liquid measuring apparatus. W. Turbull  
Lock. J. J. Dillenbeck et al  
Lock device, combination. M. Mosler  
Loom, narrow fabric. O. A. Steere  
Magnet, polyphase. W. M. Scott  
Mail bag. E. C. Jordan  
Match making and boxing. 2 pats. C. Carr  
Meat hanger. J. J. Fitzgerald  
Merry-go-round. J. W. Hile  
Metal drill. J. Mills et al  
Metal working tool. B. M. W. Hanson  
Metal working tool. E. C. Peck  
Mine gate. W. H. Tschantz  
Mining machine. W. T. Moss  
Miter board attachment. P. A. Holmberg  
Moistener and sealer, envelop. H. A. Thexton  
Mop. V. Winquist

Mower grass catcher, lawn. W. J. Brennan  
Mowing machine. J. A. Allen  
Mowing machine. R. L. Everett  
Music leaf turner. G. A. Robbins  
Nut lock. J. A. Overall  
Oil burning apparatus. H. Luckenbach  
Oil cup, sight feed. H. Ritter  
Oil from water, separating. V. Camiz et al  
Oil stone box. W. Black, jr  
Optical surfaces, forming. P. Gautier  
Ore pulverizer, railway. H. Mann  
Ore separator. F. A. Pratt  
Oven. H. Adler  
Overflow trap. F. A. Radcliffe  
Package and lantern, shipping. W. E. Mayo  
Packing, metallic ram. R. P. Shilling  
Paper box. E. A. McMillin  
Paper box machine. I. L. Sheldon  
Paper cutter. O. C. Hale  
Paper sack holder. G. H. Henkel et al  
Penholder and attachment. E. Barlach  
Photographic finder cover. W. G. Harris  
Photographic negative, marking. J. G. Baker  
Pianoforte action. T. C. Lewis  
Picture frame device. L. A. Belmont  
Pipe core. J. W. Bonta  
Pipe covering. W. G. Chapin  
Piston or plunger. W. Dockum  
Plane, shoot. V. Rovele  
Planing and matching machine. G. W. Bugbee  
Planing machine feeder. J. R. Thomas  
Planter, corn. W. P. Hunt et al  
Plaster. W. H. Beardsley  
Plow, subsoil. T. W. Campbell  
Printed fabrics. J. J. Beale  
Printing, inking device. A. D. Keneston  
Printing machine, fabric. H. M. Harley  
Projectile, explosive. C. Coleman  
Projectiles, arranging. P. Pondorf  
Pruning shears. A. W. Conaster  
Pulley, split. G. P. Brubaker  
Pulverizing machine. J. C. Clark  
Pump, mercurial air. H. S. Maxium  
Pumping engine. 2 pats. H. L. Perrine  
Puzzle. D. McGennis  
Pyrometer, pneumatic. E. A. Uehling et al  
Railway coach device. J. S. McKenzie  
Railway frog. C. F. Kress, jr  
Railway joint. C. Smith  
Railway switch. M. S. Pitman  
Railway train, safety van for. J. Emden  
Railway, elevator. G. Barker  
Railway device, surface. M. T. A. Kubierschky  
Range, gas. O. P. Moon et al  
Razor stop. W. D. Evans  
Reflector, incandescent lamp. W. D. Evans  
Refrigerator. B. M. Stewart  
Refuse destructor. J. A. Baker et al  
Rivet catcher. W. J. Beighey  
Rock and ore breaker. E. E. Hanna et al  
Roller and harrow. N. Schwartz  
Rotary engine. E. Bennett  
Rotary engine. H. A. Buck  
Rotary engine. E. A. Wilcox  
Sands, means for mixing. W. Duncan  
Sash balance. G. Barnes  
Sash fastener. G. W. Manuel  
Sash lifter. R. Washburn  
Sash lock. A. R. Ferguson  
Sausage linking machine. C. E. Avery  
Saw guide. J. A. Leaf  
Saw guide, band. F. J. Perkins  
Saw horse. O. E. Barnett  
Saw tool. E. L. Post  
Saw tooth shaping. F. W. Walquist et al  
Saws, sharpening gangs of. C. Carr  
Sawing apparatus, band. T. Kirschner  
Scale, calculating, weighing. F. L. Fuller  
Scoop or bucket. C. Berghoefer  
Screw cutting die. C. J. Harrington  
Scythes, sickles making. R. Commichau  
Sealing apparatus, jar. 3 pats. W. A. Lorenz  
Secondary battery. O. Behrend  
Sectional boiler. H. M. Hoffman  
Seeder attachment, broadcast. L. A. Wright  
Sewing machine. C. A. Dearborn  
Sewing machine, filled sack. L. E. Curtis  
Sewing machine, looped fabric. W. H. Beck  
Shade, curtain bracket. G. W. Rush  
Shade fixture, window. F. B. Moore  
Shafts, propeller regulator. L. Troubetzkoy  
Ship. O. Akerberg  
Shoulder brace. A. Scott  
Shuttle, self threading. E. H. Ryon  
Singeing machine. R. Atherton  
Slug or nail strips. H. H. Buffum  
Snap hook. G. H. Stewart  
Snuff tablet. 2 patent. W. L. Dudley  
Shoe, flexible sole. J. Beck  
Speculum. W. Scheerer  
Spining, textile machine. W. J. Morgan  
Sprinkler. J. B. Rhodes  
Stacker, pneumatic straw. J. K. Sharpe jr  
Staking machine. I. Vaughn et al  
Steam boiler. W. H. Cook  
Steam engine. H. A. Zinn  
Steamer and boiler, combined. R. W. Welty  
Steamer, boiler culinary. E. E. Ward  
Steel, reproducing device. W. Smith  
Stove. V. Spindler  
Strainer, vessel. J. Buckley  
Strap cutting machine. C. W. Newton  
Swing. F. L. Harris  
Syringe nozzle. F. Hurbut  
Tag, shipper's. J. E. Hewett  
Tap, beer. R. E. Kabisch  
Telephone, automatic. E. E. Ries  
Telephone transfer board. 3 pats. F. B. Cook  
Thill coupling. W. A. Lapp  
Thill coupling. G. B. Lutz  
Thill, vehicle. C. A. Ray  
Ticket, railway. G. A. Hinkle  
Tile structure. F. L. O. Wadsworth  
Tire, cushioned. 2 pat. E. Kempshall  
Tire shrinker. T. R. Pangle  
Tire valve inserter. A. Whisler  
Tire value support, air pump. E. Gabel  
Tobacco pipes, nicotine tube. P. Johnson  
Tool, combination. W. A. Hauger  
Tool holder. J. M. Normand et al  
Top roll. L. W. Campbell  
Torpedo shell. L. Gathmann  
Track sanding device, car. A. L. Sprague  
Traction increasing device. S. Woodall  
Transplanter. H. C. Benton  
Trap. O. F. Baum  
Trap. J. D. Olinger  
Trap hook. W. Gabrielson  
Tree tifting, transporting. D. F. Prevost  
Trousers clasp. A. B. Herald  
Truck, carrier, combined. E. A. Barnes  
Truck, car. 2 patents. E. G. Nicewaner

Truck, double. W. H. Wilkinson et al  
Truck, house moving. J. E. Tandy  
Truck, maximum traction. S. E. Clarkson  
Tubes, steel, metal. T. B. Sharp et al  
Tug, hame. 2 patents. A. Grisso  
Turbine, steam. C. A. Parsons  
Type for Arabic. A. R. Guest et al  
Type setting apparatus. L. K. Johnson et al  
Type writing machine. L. S. Burridge  
Typewriting machine. C. H. Shepard  
Umbrella, bicycle. G. Valiant  
Umbrella, folding. F. G. Grove et al  
Unloader. W. G. Jibben  
Upholstering apparatus. E. F. Braisher  
Valve. J. A. Dyblie  
Valve action, pneumatic. J. Wieser  
Valve gear, pumping engine. H. L. Perrine  
Valve, relief. H. S. Ringi  
Valve, steam or fluid actuated. J. B. Rhodes  
Valve, straightway. E. H. Lunken  
Valve, tank. A. R. Dempster et al  
Vapor burner. N. G. Ross  
Vehicle, automobile. F. L. Dyer et al  
Velocipede bearing. E. G. Latta  
Velocipede, cable. J. W. Hutchinson  
Violin key. C. J. Beauvais  
Voting machine. C. Simon  
Voting machine. G. Wilson  
Waist. C. Hardt  
Wardrobe. C. E. Cox  
Washing, cleaning. T. J. Whalen et al  
Watch roller pin fastening. E. J. Haverly  
Water closet. J. B. Rhodes  
Water and air elevator. W. H. Shafer  
Water heater, instantaneous. G. Wilson  
Water heater, tubular gas. J. Mander  
Water motor, superheated. M. Hutin et al  
Water sterilizing apparatus. L. Maiche  
Water tube boiler. H. Blessinger  
Wave power motor. D. K. Bryson  
Weaving double faced fabrics. J. Caldwell  
Weed puller. R. Russell  
Well operating device. J. A. McAllister  
Wheel. J. W. Eisenhuth  
Whiffletree coupling. G. E. Farriss  
Whiffletree coupling. C. S. Thompson  
Windlass. C. A. Morrison  
Windmill, pump coupling. F. A. Bagley  
Window frame. A. N. McBean  
Window operating device. J. P. Yawn  
Wine, manufacturing. E. Keller  
Wire drawing machine black. J. M. Chatfield  
Wire fabric machine. C. M. Lamb  
Wire stretcher. M. E. Davis  
Work box. E. Benton  
Wrench. J. H. Flanagan  
Wrench. F. C. Jaeger  
Wrench. M. Williams

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Acids, apparatus for making. J. V. Skoglund  
Air brake coupling. F. W. Harper  
Air compressor, tide power. C. M. Johnson  
Air motor apparatus, compressed. A. Sundh  
Alcohol, recovering waste. 2 pats. M. Hickey  
Ash pan. W. C. Holtsclaw  
Astragal for glaziers. A. S. Douglas jr  
Axle box for wheels, rubber. L. P. Rollings  
Axle lubricator, car. A. A. Freeman et al  
Bale tying device. F. B. Shuster  
Band cutter and feeder. W. C. Wilka  
Bearing, ball. M. Foidart  
Bearing for wheels, ball. W. Jenkins  
Bearing, roller. M. Foidart  
Bearing, roller thrust. F. Whitney  
Bearing, roller thrust. W. S. Rogers  
Bed. G. W. Bent  
Bed brace, slat fastener. P. H. Treadway et al  
Bed spring. F. A. Palmer  
Bedstead, folding. 2 pats. J. W. Pepper  
Belt clamp. C. Jackson  
Belt fastener. F. Kane  
Bicycle. J. A. Kelly  
Bicycle. W. H. F. Young  
Bicycle connecting frame. J. C. Schleicher  
Bicycle frame. H. Dixon  
Bicycle handle bar. E. Phipps  
Bicycle lock. O. von Nordhausen  
Bicycle parcel carrier. J. M. Certain  
Bicycle saddle support. D. W. O'Conner  
Bicycle support. P. A. Shanklin  
Bicycle support. F. Wyal  
Bicycles, means for storing. M. R. Jewell  
Bit stock. M. Barber et al  
Boat lowering apparatus. G. S. A. Ranking  
Bolt and nut lock. C. E. Crosby  
Book case, sectional. E. E. Baker  
Boot cleaner. G. W. Smead et al  
Boring, disintegrating earth. G. Wetherby  
Bottle stopper. H. A. Knight  
Bottle washer. H. E. Decker  
Bottles, &c. A. Paterson  
Bottles, jars, elastic cap. H. C. Shearman  
Brake beam holder. E. E. Crowell  
Brake rigging, push bar. J. C. Wands  
Braking apparatus. G. F. Labram  
Briquet press. J. T. Davis  
Broom head clamp. S. P. Herron et al  
Brush, electric hair. W. J. Wertz  
Butter cutting apparatus. R. A. Simpson  
Button boring machine. 2 pats. D. B. Shantz  
Cabinet, drop file. C. H. Besly et al  
Calcing furnace. A. H. Wetley  
Calendering machine. H. M. Harley et al  
Calendering machine. M. J. Whitlock  
Camera, magazine. D. H. Houston  
Can top and lid, milk. A. L. Foreman  
Canning machine. O. Rubarts  
Car brake. J. Ritchie  
Car brake. J. N. Zech et al  
Car construction, railway. T. L. McKeen  
Car coupling. G. Meshamer  
Car coupling device. A. Keusink  
Car draw head, railway. T. L. McKeen  
Car fender, street. J. H. Parmelee  
Car line, elevated electric. J. H. Cooley  
Car sand box. J. C. Duner  
Car seat. E. U. Gibbs  
Car seat. J. S. Johnston  
Carbureter. J. E. Doze  
Carding engine. R. W. Eaton  
Carpet stretcher. W. H. Dexter  
Cartridge shell heads. C. R. Richards  
Chair leg fastener. W. H. Sleeth  
Charging machine. D. H. Lentz  
Checking or unchecking. T. A. Killman et al  
Chuck. W. Scott  
Churn power. J. T. Coleman  
Cigar rolling machine. C. B. Schultz



Circuit breaker, automatic..... E. F. Winfield  
Cleaning device..... M. Nasberg  
Clock, alarm..... L. E. Favre  
Cloisone ware, ornamental..... T. Püster  
Cock, eel guard..... H. Mueller  
Cock, gage..... J. J. Cain  
Coffee products, utilizing waste..... L. Hesse  
Colter..... F. M. Neff et al  
Composing machine..... R. C. Elliott  
Conveyer..... W. B. Pero et al  
Conveying apparatus..... G. A. Amsden  
Conveying apparatus, 4 patents..... J. T. Cowley  
Cooker, steam..... J. T. Walter  
Copperas, making..... A. S. Ramage  
Cord fastener..... L. M. Devore  
Cotton press..... M. Swenson  
Crate, collapsible..... G. Simpson et al  
Cultivator..... N. Delaney  
Cultivator..... B. C. Smith  
Curbing..... F. W. Arnold  
Curtain fixtures..... W. H. Stockman  
Curtain pin..... S. F. Stenner  
Cutting and grinding mill..... J. S. Newlin  
Cutting stranded wire..... G. L. Hoir et al  
Cyclometer..... F. P. Prindle  
Darning last..... I. Jansen  
Digester..... D. Sullivan  
Display form..... G. R. Sharf  
Door check and spring..... J. J. Larimer  
Door hanger..... A. J. Ives  
Dough, making by machine..... W. S. Corby et al  
Draft rigging..... W. Case  
Drafting instrument needle..... P. M. Chamberlin  
Dumping apparatus..... B. Sims  
Dye, black sulfur..... W. H. Claus et al  
Dye, blue black..... C. O. Muller  
Dye from cotton seed oil..... E. S. Wilson et al  
Dye, green, 2 patents..... A. Herrmann  
Dynamo, portable hand..... S. Evershed  
Educational model..... G. Rossi-Diehl  
Egg carrier..... W. H. H. Rogers  
Electric battery..... J. Post  
Electric cable, junction box..... A. Sundh  
Electric excitant, chemical..... J. Post  
Electric heater..... E. E. Gold  
Electric heater..... R. Lundell  
Electric light, number to burn..... A. Peters  
Electric linemen's repair tool..... J. H. Sullivan  
Electric dynamo, regulator..... R. E. Ball  
Electrodepositing anode..... H. L. Haas  
Envelope, coupon check..... J. L. Horn et al  
Evaporating pan..... B. Hoskins  
Excavator..... F. S. Reeder  
Explosive compound..... C. F. Hengst  
Eyelet..... E. Kempshall  
Farm gate..... T. F. DeWitt  
Fastening device..... J. T. Robin  
Feed regulator..... A. B. Helbig  
Feeding machine, pneumatic..... W. Carter  
Fence machine, wire..... G. O. Meservey  
Fertilizing compound..... J. H. Brewer  
File, paper..... E. Fowler  
Filter..... G. Raab et al  
Firearm..... J. G. Aeschbacher  
Fire escape..... J. Cotter  
Fire escape..... C. Mace  
Fire escape..... J. Mignot  
Fireproof floor, ceiling, &c..... E. Homan  
Fish hook..... R. Koen  
Flat iron, rest or support..... F. H. Chase  
Float..... V. D. Anderson  
Fluid pressure engine..... H. J. Kimman  
Forge, portable..... T. Lennox  
Fruit drier..... E. McClatchey  
Fruit grader..... R. M. Pratt  
Furniture frame..... O. G. Franks  
Fuse, electric..... I. Kitsee  
Game apparatus..... W. C. Farnum  
Garment stretcher..... S. Hillwig  
Garment supporter..... G. Kracker  
Garment supporter..... J. G. Wagner  
Gas burner, incandescent..... A. S. Newby  
Gas engine..... R. Nuttall et al  
Gas generator..... P. Lacroix  
Gas generator, acetylene..... W. T. Love  
Gas generator, acetylene..... F. O. McQueen  
Gas generator, acetylene..... F. W. Preussel  
Gas generator, acetylene..... L. B. Walters et al  
Gas generator, acetylene..... R. H. Witz  
Gas generator, acetylene..... W. W. Wythe  
Gas machine, acetylene..... J. S. Seely et al  
Gas producer..... M. Taylor  
Gate..... S. D. Fry  
Gate..... A. J. Wood  
Glass beveling machine..... E. H. Pearce et al  
Glass panes, cleaning..... C. Wernicke  
Glory hole furnace, portable..... F. Wallace  
Grain drier..... H. W. Cutler  
Grain drill..... W. A. Morgan  
Gravity motor..... J. A. Workman  
Grinder, chiller..... A. Basener  
Grinder, chiller..... E. F. Gannon  
Grinding machine carriage, 2 pats..... A. B. Landis  
Grinding cutter bars..... A. S. Robinson  
Grinding, buffing machine..... J. Koenig  
Guns on ships, steadying..... B. Tower  
Guns, worm gear..... A. T. Dawson et al  
Hame and trace connector..... J. Swigert  
Hame fastener..... J. H. Hill  
Hammer, foot operated..... F. Dowling  
Hammer or riveter..... F. A. Kirby  
Hand shears for sheet metal..... G. Thuiller  
Harrow..... J. H. Brown  
Harrow..... U. D. Miller  
Harrow and cultivator..... W. A. Brantley  
Harrow tooth..... M. H. Jerdee  
Harrow tooth fastening..... J. H. Brown  
Harvester, corn..... J. A. Stone  
Harvester reel..... C. W. Stewart  
Hassocks, manufacturing..... W. H. Muth  
Hat holder for milliners' use..... J. Bartel  
Hay rack..... T. Pritchard  
Hearth and welding furnace..... M. McDowell  
Heating, annealing, 2 pats..... W. Griffith et al  
Horse boot protector..... J. D. Keller  
Horseshoe, elastic tread..... J. Patrick  
Horseshoe pad..... W. S. Laycock  
Horseshoe, spring..... W. Hamilton  
Hose stripping apparatus..... D. C. Carr  
Hygroscope..... F. Renzo  
Illuminating contrivance..... H. Gantke  
Incandescent mantle support..... A. S. Newby  
Index, card..... F. Macey  
Inhaler..... E. E. Gardner  
Ironing table, combination..... J. F. White  
Irrigation and drainage..... E. A. Bagby  
Joint for building members..... A. De Man  
Key fastener..... P. R. Hazeltine et al  
Kiln or boiler furnace..... W. C. Mitchell  
Lace fastener, shoe..... H. Larew  
Lacing, rubber tipped..... E. Kempshall  
Lamp, acetylene gas generator..... E. Evans  
Lamp, acetylene gas generator..... W. O. Nelson

Lamp bracket..... W. C. Homan  
Lamp burner, gasolene..... A. S. Newby  
Lamp, electric arc..... P. H. F. Spies  
Lamp, vapor..... W. Somerville et al  
Land roller and harrow..... J. C. Schaffer  
Lantern..... R. Jackman  
Last..... W. B. Arnold  
Last..... J. Japiot  
Last or follower..... A. H. Brigham  
Latch..... W. B. Brooker  
Lathe, turret..... C. M. Conradson  
Lathe, turret..... N. H. Fay  
Life preserver..... F. Stratton  
Lifting jack..... F. M. Floyd  
Linotype machine, 2 pats..... J. R. Rogers  
Liquid dispensing vessel..... H. C. Beman et al  
Liquid separator..... C. H. Hackett et al  
Lithographic stone surfacing..... C. G. Warner  
Lock lubricator..... J. C. Maass  
Loom..... H. I. Harriman  
Loom shuttle..... S. M. Hamblin  
Loom warp stop motion..... W. E. Allen  
Loom warp stop motion..... J. H. Northrop  
Lubricator..... E. D. Bangs  
Lubricator..... A. A. Freeman et al  
Machine tools, operating..... E. O. Preissler  
Marble or stone, artificial..... J. E. Summers  
Medical tampon..... F. von Raitz  
Metal punching apparatus..... G. B. Tennant  
Metal, supporting device..... E. I. Braddock  
Metals, refining, 2 pats..... B. Talbot  
Milk cooling, areating..... A. L. Foreman  
Mill..... J. Daiu jr  
Mill products, testing..... J. Warrington  
Mirror stand..... C. R. Arnold  
Mold gate pattern..... J. B. Renshaw  
Momentum of moving bodies..... F. Burger  
Monkey wrench..... T. Jensen  
Nail..... W. L. Horne  
Notice, advertising device..... A. Weissman  
Numbering machine..... W. W. Sawyer  
Nut lock..... J. G. Vose  
Offset webs, handling..... C. E. Pattberg  
Oil can, non-explosive..... R. A. Bailey  
Oil can, non-explosive..... J. J. Rhineland et al  
Oil engine..... H. N. Bickerton et al  
Ore concentrator..... H. H. Cramer  
Ore concentrator..... H. Earle  
Packing rings, sectional..... A. W. France  
Pail, water..... A. Muller  
Paper box machine..... J. Godfrey  
Paper cutting, folding..... E. H. Cottrell et al  
Paper cutting machine..... E. M. Lockwood  
Photographic paper..... H. Kuhu  
Photographic process..... H. S. Williams  
Photographic shutter..... M. F. Jurinck  
Pile..... S. K. Behrend  
Pipe wrench..... J. C. Speirs  
Pipe wrench, chain..... P. H. Bohner et al  
Pipes, constructing sewers..... J. H. Martin et al  
Piston, hot air engines..... W. R. Kennedy  
Plow and planter..... S. B. Stokely et al  
Plow foot and fender..... G. L. Young  
Pneumatic carrier..... A. A. Mudd  
Pneumatic despatch tube..... O. Ames  
Pneumatic despatch tube..... A. W. Pearsall  
Pneumatic drill..... C. T. Smith et al  
Pneumatic rotary drill..... H. J. Kimman  
Poison distributor..... C. W. Martin  
Power transmitting..... E. Winans  
Precious metals from ores..... L. E. Porter  
Prepayment, coin-in-the-slot..... W. L. Dennis  
Press..... J. M. H. Walters et al  
Printing and type written work..... S. A. Neidich  
Printing machine..... L. W. Southgate  
Printing machine, 2 patents..... H. A. W. Wood  
Printing machine, plates..... E. Fisher  
Printing machines, perfecting..... F. Meisel  
Printing press delivery..... G. F. Read  
Pully, expandible..... P. Solhege  
Pulley, grip..... A. Painter  
Pulp, wet machine..... J. H. Baker et al  
Pump..... W. F. Smith  
Pump, compressed air..... P. B. Perkins  
Pump, rotary..... A. W. Case et al  
Puzzle..... F. R. Skinner  
Railway and car, hanging..... C. von Thal et al  
Railway, cycle..... W. Shakespeare  
Railway, electric..... G. W. McClintock  
Railway, electric..... J. M. Murphy  
Railway for recreation..... W. Stenning  
Railway spike or nail puller..... T. G. Brown  
Raisin seeder..... W. M. McCounaughay  
Raisin seeding machine..... F. H. Snyder et al  
Ram, hydraulic..... J. C. Gelly  
Ratchet wrench..... J. Asbury  
Reading stand..... W. F. Loan  
Reel..... E. I. Olinger  
Registering machine..... A. F. Bardwell  
Rein guard..... P. M. Heerwagen  
Ribbon or band..... S. Borton  
Rubber substitute or artificial, 2 pats..... O. Lugo  
Rug, woven..... H. Hardwick  
Ruler..... L. B. Jones  
Sack lifter..... F. G. Broughton et al  
Sad iron waxing device..... H. A. Kean  
Saddle..... E. E. Mallory et al  
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Sail reefing device..... G. Achterberg  
Sash fastener..... W. C. Belcher  
Saw guard or shield, circular..... A. Cook  
Sawmill carriage..... A. J. West  
Saw set..... F. Hanna  
Saw, tubular crown..... H. M. Dalzell  
Scale, computing, reissue..... W. F. Stimpson  
Scale, platform weighing..... J. S. Cox  
Scow, dumping, 2 pats..... C. C. Bowers  
Screen or sieve..... A. Adams  
Screening apparatus for coal..... W. S. Cherry  
Screws, &c., forming nicks..... F. T. Giles  
Seal lock, 2 patents..... C. E. Richardson  
Separator..... R. W. Jessup  
Sewing machine, hemstitch..... A. Grieb  
Shade hanger..... S. Gray  
Shipping, displaying case..... W. Macdonald  
Shoe machine gage..... E. E. Winkley  
Shoemaker's repair jack or last..... D. Rounds  
Shoulder pad..... E. F. Gaddis  
Shutter fastener..... J. Sabold  
Shutter slit operating means..... H. A. Cordray  
Shutter stay..... T. A. Weston  
Sidewalk light, prismatic..... S. C. McCormack  
Sifter, ash..... H. R. Reynolds  
Sign, electrically illuminated..... J. E. Lloyd  
Signal plate..... E. E. Yaxley et al  
Signal reminder, locomotive..... J. Murphy et al  
Sleeves, holding shirt..... A. J. Barber  
Slider..... C. H. Hahn  
Slider for vegetables..... J. W. Hart  
Snout splitter for swine..... J. G. Smith  
Soldering machine..... R. D. Hume  
Sole laying machine..... E. E. Winkley  
Soot killers, manufacture of..... O. R. Moffet

Spading machine..... A. R. Miskin  
Spectacular machine..... J. E. Grosjean  
Sponging device..... A. Bray  
Sprinkler and dirt wagon..... J. J. Eck  
Stacker, automatic..... W. C. Wilka  
Stacker, straw..... J. Chial  
Stair rod securer..... A. L. Carter  
Stamp, hand..... F. J. Becker  
Stamping press..... R. F. Sprinkle  
Steam boiler..... C. B. Rearick  
Steam engine..... J. A. Hyter  
Steam engine, atmospheric..... F. M. Leavitt  
Steam generator..... G. H. Hardie et al  
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Weather strip..... J. L. Knight  
Weather strip..... W. B. Mahan  
Web drying machine..... W. B. Barlow  
Weighing machine..... 2 patents..... W. F. Braun  
Wheel..... W. K. Hoagland  
Whiffletree hook..... F. W. Key  
Window..... E. Schmidt  
Window bracket..... H. M. Johnson  
Winding machine attachment..... J. P. Cronin  
Wire coiling die..... C. J. Lane  
Wire stretcher..... Z. A. Curtis  
Woodworking machine..... A. C. Cloud  
Worm wheel cutting..... R. H. Pfander  
Wrench..... J. L. Braun  
Wrench..... J. J. Fahrney  
Wrench..... H. E. Koch  
Wrench..... C. E. Williams  
Wringer..... W. T. Bradley

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Acetylene generator..... W. F. Cooper  
Adding machine..... B. Work et al  
Advertising device..... E. Cherry  
Air and gas engine..... J. W. Eisenhuth  
Air compressing engine..... E. A. Rix  
Air ejector for vessels..... G. Quanonne  
Animal trap..... C. M. Williams  
Ash box and shovel..... W. S. Anderson  
Automobile..... P. J. A. Schuoor  
Axle setting gage..... G. A. Peterson  
Bag filler..... S. Marshall  
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Band cutter..... W. P. Rundle et al  
Baths, waste pipe..... S. W. Lewis  
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Batteries, condition of storage..... H. F. Cuntz  
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Bed couch..... W. E. Buser  
Bed, folding..... J. P. Lein  
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Bicycle crank hanger, bracket..... W. B. Spencer  
Bicycle gear, changeable..... F. M. Swayze  
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Bicycle support..... 3 patents..... W. H. Hart jr  
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Billard or pool table..... J. W. Wilkinson  
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Book, bookkeeping system..... J. W. Harland  
Book, manifold sales..... E. Carney  
Books, binding..... J. Lewishwaite  
Boot or shoe..... W. Gordon  
Boot or shoe tops, folding..... W. J. Dix  
Bottle..... T. Thompson  
Bottle and glass combination..... W. Baum jr  
Bottle float..... G. R. Hemstreet  
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Bottle stopper and extractor..... R. S. Pickett  
Bottle stoppers machine..... H. Gates et al  
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Box..... J. V. Otten  
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Bread or cake cutter..... J. Jenson  
Bricks, thermo-electrical building..... J. Matthias  
Broom head..... G. M. Bowman et al  
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Butter packing machine..... R. R. Cross  
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Cable grip..... W. W. O'Malley  
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Calipers, micrometer..... J. P. B. Wells  
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Cane handling apparatus..... J. P. Kemper  
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Car brake..... C. A. Kruse  
Car center plate, railway..... C. F. Street  
Carburetor..... W. H. Thayer  
Carding engine..... J. Shaefer  
Carriage, child's reclining..... C. B. Jones  
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Cash register..... 2 patents..... E. F. Spaulding  
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Cattle guard..... W. T. Payne  
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Cement manufacturing..... H. I. Bartholomew et al  
Chaff assembler and conveyor..... S. K. Landis  
Chain, drive..... J. Neil  
Checking or unchecking device..... H. H. Dudley  
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Cigar box..... M. Brown  
Cigar tip cutter..... S. L. Lederer  
Cigars, cutting, printing..... I. W. Heysinger  
Cigarette, counting, packing..... M. del Castillo  
Cigarette mouthpieces..... T. Whitehorn et al  
Clamp for fabric making..... J. Sommer  
Clay, molding cups, &c..... H. Briggs  
Clips, manufacturing..... F. Canfield  
Clothes pounder..... W. T. Parnell et al  
Clutch, friction and stop..... H. E. Sharp  
Coal cutting machine, hand..... H. Ebert  
Coat or hat hook..... A. W. Parmalee  
Cock, cylinder drain..... F. M. Densig  
Coffee or malt drier..... F. E. R. Okrassa  
Coin controlled apparatus..... J. Mason  
Collar, horse..... G. A. Miller  
Color sphere and mount..... A. H. Munsell  
Conduit, flexible metallic..... E. T. Greenfield  
Conduit, underground..... C. H. Sewall  
Controller operating device..... W. H. Conrad  
Convertible tub..... N. F. Hurdell  
Cooling, refrigerating..... W. Helm  
Cord holder..... J. Altman  
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Corn husking machine..... W. H. Sells  
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Cupel machine..... F. M. Iler  
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Cutter bar..... J. F. Kukacka  
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End gate..... J. F. Overcash  
Engine reversing mechanism..... W. W. Leach  
Engine stopping device..... J. J. Kaye  
Evaporator..... W. D. Baker  
Eyeglasses, &c., holder for..... E. P. Tirrell  
Fare register mechanism..... J. F. Olmer  
Farm gate..... W. H. Kemper  
Feeding, weighing..... P. C. Waring  
Fence joint..... J. T. Ward  
Fence machine..... A. J. Kauffman  
Fence, wire..... J. E. Head  
Fiber drawing machines..... A. W. Mathewson  
Fiber, splitting raw..... F. Szymanski  
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Fireproof door..... J. S. Reynolds  
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Fodder or ensilage cutter..... L. S. Bedford  
Folding box..... H. Schnackenberg  
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Follower..... H. F. Browne  
Fruit box, ventilated..... W. L. Hawley  
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Gas burner, incandescent..... A. A. Cowles  
Gas engine..... G. S. Shaw  
Gas generator, acetylene..... W. C. Sterne  
Gas generator, acetylene..... P. D. Wescott  
Gas generator, acetylene..... J. C. Wightman  
Gas meter..... J. C. Sutherland  
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Gear, reversing..... A. Brott  
Gear, variable speed..... E. J. McClellan  
Gearing..... F. O. Bullis  
Gearing, friction..... J. C. Howell  
Gearing, variable speed..... L. L. H. Gerard  
Gin saw filer..... R. J. Reynolds  
Glass articles, making hollow..... P. T. Sievert  
Globe..... T. W. Synnot  
Governor, explosive engine..... A. C. Stewart  
Grain binder sheaf shocker..... M. Light et al  
Grain cleaner..... G. L. Beadell  
Grate..... W. McClave  
Grate bar..... G. S. Lee  
Grinding machine..... W. C. Baker  
Grinding machine, drill..... W. C. Heister  
Grinding mill, duplex..... E. H. Webster  
Gun barrels or tubes, rolling..... C. P. Carlson  
Guns, wheel brake for field..... A. Resow  
Hair pin..... H. Nathan  
Hammock support..... I. E. Palmer  
Handle bar..... W. E. Kelly  
Harbor or coast defense, reissue..... A. van Bibber  
Harvester attachment, potato..... G. M. Ross  
Harvesting cornstalks..... T. Shields  
Harvesting cotton, means for..... M. S. Curley



Hasp lock.....D. Kerekes  
 Hat fastener.....G. Schmitt  
 Hat packing ring.....J. Marshall  
 Hat rack.....J. F. Halloran, jr  
 Hay rake.....G. H. Milleville  
 Heater, steam or hot water.....W. F. Burns  
 Heel bolt.....B. W. Powell  
 Heel nailing machine.....F. F. Raymond  
 Hemmer.....J. J. Gillis  
 Hemp brake.....J. Heaney  
 Hides, bating.....C. M. Koch  
 Hinge, gate.....J. J. Ober  
 Hitch hook.....M. W. Reeves  
 Hog catching implement.....S. Rafi  
 Hog trap.....T. Fisher  
 Hoisting apparatus.....C. W. Nason  
 Hoisting machine safety device.....T. H. Oxnham  
 Hook-and-eye-carding machine.....T. I. Carmody  
 Horse tail protector.....H. H. Jones  
 Horseshoe, soft tread.....T. N. Jones  
 Horseshoe, soft tread.....E. E. Mears et al  
 Hub.....R. R. Boggs  
 Incandescent mantle.....C. P. Schütz  
 Indicator.....G. B. French  
 Insect destroyer.....R. B. May et al  
 Insect destroyer.....A. F. Seveance  
 Insulating panel for ships.....G. P. Erhard  
 Insulator, section.....J. S. Schumaker et al  
 Jar closure.....J. H. Fowler  
 Keys, device for holding.....J. H. Polhemus  
 Knitting machine.....H. A. Houseman  
 Lacing-stud-setting machine.....W. P. Bartel  
 Ladder, combination step.....W. L. Skelly  
 Lamp.....R. J. Robertson  
 Lamp, acetylene gas.....W. C. Homan  
 Lamp burner.....S. B. Morss  
 Lamp burner.....F. T. Williams  
 Lamp burner and wick holder.....J. L. Stone  
 Lamp, electric.....C. Van Deventer  
 Lamp igniter, cycle.....W. Angress  
 Lamp shade.....R. W. Pittman  
 Last.....H. Brown  
 Lasting machine.....W. H. Dorman  
 Laundry apparatus.....W. H. Welsh  
 Leather die, making.....J. L. McCaul  
 Leg, artificial.....A. L. Petcrs  
 Life-preserver.....H. Aylmer  
 Lightning arrester.....C. C. Chinn  
 Loading movable carrier.....A. Painter  
 Lock.....E. Sargent  
 Lunch box.....A. J. Osborne  
 Mail bag catcher.....S. E. Gibson  
 Mail marking device.....E. M. Judd  
 Massage apparatus, water.....H. Ulrich  
 Match safe.....P. G. Hale  
 Measuring instrument, electrical.....J. F. Stevens  
 Measuring intensity of light.....R. C. Drinker  
 Mechanical movement.....H. W. Honeyman  
 Milk modifier, home.....E. Straus  
 Milk sterilizer.....J. Mitchell et al  
 Mine door.....A. S. Robinson  
 Monkey wrench.....C. H. Tebbetts  
 Motor.....C. H. Peck  
 Mower and reaper, cap for.....H. L. Hopkins  
 Mower, lawn.....T. Coldwell  
 Musical instrument, mechanical.....C. A. Kuster  
 Necktie fastener.....J. W. Blundon  
 Needle threader.....V. Kobler  
 Negative holding device.....C. J. Bousfield  
 Nuclein, making ferruginous.....A. Jolles  
 Nut and bolt-head, safety.....J. W. Champion  
 Nut lock.....J. Tirrell, jr  
 Nut lock.....L. Wade  
 Oils, material for feeding.....L. Silverman  
 Opera glass shutter.....J. W. Patterson  
 Ore concentrator.....A. Ten Winkel  
 Ores and sands, treating.....J. P. McEvilly  
 Ores, separating.....3 patents.....C. O. Payne  
 Packing box.....H. H. Higham  
 Panel and tile therefor.....F. L. O. Wadsworth  
 Paper box, knockdown folding.....A. R. Hibson  
 Paper for boxes, preparing.....F. Meisel  
 Paper, pulp for making.....F. C. Michaelis  
 Para-oxylphenylamin.....H. Gussman  
 Passage closing device.....S. E. Stimpson  
 Paste, powder for.....S. Schweitzer  
 Peanut digger.....L. E. Starr  
 Pelt refining machine.....P. F. Comstock et al  
 Pencil, magazine.....G. W. Rice et al  
 Pencil sharpener.....J. A. Webster  
 Penholder.....F. T. Stevens  
 Perambulator.....W. H. English  
 Petroleum and derivatives, refining.....A. Kayser  
 Photometer.....C. Deshler et al  
 Piano action.....W. C. Vough  
 Piano action, upright.....W. C. Ellis  
 Pile driver.....J. W. Blundon  
 Pinions, making.....G. E. Hart  
 Pistol, magazine.....J. H. Wesson  
 Placards, holder for.....W. L. Poehlmann  
 Planer shaping machine.....H. W. Rightmyer  
 Plants, treating growing.....A. Sattler  
 Plow, garden.....W. A. Stowe  
 Plow, tongueless disk wheel.....S. D. Poole  
 Post-office case.....M. S. Field  
 Potato digger.....D. Denis  
 Preserving by gases.....A. L. Lawson et al  
 Printing machine.....I. Lam  
 Printing machine, fabric.....H. M. Harley  
 Printing press.....G. J. Olsen  
 Printing press.....G. W. Porter  
 Proof press.....T. G. Claridge  
 Prospecting drill.....D. McCabe  
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 Pulley, power transmission.....J. H. Buckley  
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 Pump.....A. L. Reynolds  
 Pump governor.....F. Hoffman  
 Pump coupling, automatic.....J. W. Bates  
 Punch, hydraulic.....F. H. Sillman  
 Punch, hydraulic.....C. Wigtel  
 Quinin carbonic ether, making.....H. Thron  
 Rail joint.....F. Lott  
 Rail joint.....H. F. Gullan  
 Railway brake.....R. Weir  
 Railway construction.....F. Hachmae  
 Railway switching device.....J. Y. Porter  
 Railway ties, cutting.....C. W. Garland  
 Railway track lubricator.....R. G. York  
 Railway tracks, throwing.....D. C. Creese  
 Range, water heating.....J. Mander  
 Refrigerating apparatus.....2 pats. G. B. Hielt  
 Reostat and attachment.....L. D. Carter  
 Rice flaking machine.....A. Perry et al  
 Riveting tool, hydraulic.....F. H. Sillman  
 Road breaker and scraper.....G. W. Murray  
 Rod feeding device.....C. H. Richardson  
 Roofing gage.....J. Hinds  
 Roofing plates, cutting.....W. Martin  
 Roofing stool.....J. Hinds  
 Rotary engine.....C. M. Connor  
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Roving machine.....M. Campbell  
 Rudder, ship's.....T. V. Trew  
 Running gear.....E. T. Wade  
 Sad iron, self heating.....H. P. Terry  
 Sail fastening device.....A. G. Hupfel  
 Sand and water separator.....J. F. Reiert  
 Sash holder.....A. Z. Converse  
 Saw cable.....J. E. Luce et al  
 Scalding vat.....J. W. Kohlhepp  
 Scale hopper, coaling station.....D. A. Robinson  
 Scale, spring balance.....J. W. Culmer et al  
 Scale, weighing.....S. T. Braley  
 Scale, weighing.....G. D. Hayes  
 Scythe wrench.....H. O. Kru-chke  
 Seal, car.....L. D. Meador  
 Self leveling table.....B. M. Schumann  
 Shade support and protector.....C. L. Newby  
 Shafts, connecting device.....F. E. Hawksworth  
 Sheet feeding machine.....A. Bug  
 Sheet metal handle.....C. L. Wagandt  
 Sheet supplying device.....W. Scott  
 Sheet supporting device.....T. M. North  
 Sheet transferring mechanism.....T. M. North  
 Shelf for machines, receiving.....A. Conkling  
 Shelving.....J. M. Lippincott  
 Shirt.....A. A. Abrams  
 Shirt.....S. Elbaum  
 Shoe cleaning machine.....J. Kratofil et al  
 Shoe fastening device.....M. M. Dooley  
 Shoe fastener.....J. Donovan  
 Shoemaker's tool.....J. Kiefer et al  
 Sifter, ash.....J. C. Murphy  
 Siphon spout.....J. Fleischer  
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 Soldering iron, electrical.....R. Kuhn  
 Spindle step.....G. O. Draper  
 Spoke tenoning machine.....F. W. Forester  
 Spring lock.....C. M. F. Anderson  
 Stamp, hand.....W. B. Cauble et al  
 Staple driving machine.....M. Young  
 Stapling machine.....O. G. Rieske  
 Stapling machine.....C. Lee  
 Steam engine, compound.....J. Hardill  
 Steam heating systems.....C. A. Ball  
 Steam motor.....P. F. Oddie  
 Steam trap.....C. W. Nason  
 Steering apparatus, vessel.....J. P. Serve  
 Steering mechanism, vessel.....J. Christensen  
 Stereotype matrices, making.....J. W. Phoebus  
 Stone boat.....J. Ingells  
 Stove, oil.....A. J. Schuett  
 Stove or furnace attachment.....H. H. Korthauer  
 Stoves, adjustable hood for vapor.....S. A. Wilson  
 Street indicator, electric.....J. Y. Porter  
 String nail.....G. Goddu  
 Sugar clearing composition.....E. L. McTyre  
 Surgical instrument.....C. J. Pilling et al  
 Surgical sewing instrument.....G. E. T. Arnold  
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 Swimming apparatus.....J. S. Bartholomew  
 Syringe.....L. Bring  
 Syringe, hot air.....J. I. Richards  
 Table leveler.....G. A. Seely  
 Tack.....R. A. Brelt  
 Tape-line reel.....J. O. Smith  
 Target practice, measuring errors in.....J. B. Blish  
 Telephone.....R. F. Smith  
 Telephone system.....J. R. Bink et al  
 Telephony.....S. B. Fowler  
 Thermometer, registering.....L. F. Comitti  
 Threshing machine.....W. W. Dungee  
 Threshing machine attachment.....C. A. Paul et al  
 Threshing machine cylinder.....A. Ferri  
 Tile structure.....2 patents.....F. L. O. Wadsworth  
 Tiinner's fire pot.....J. S. Hull  
 Tire, elastic.....E. M. Birdsell  
 Tire for vehicles, shielded.....R. Mitchell, jr  
 Tire plug.....F. B. Parks  
 Tire, pneumatic rubber.....F. A. Seiberling  
 Tire, pneumatic.....J. A. S. Simonson  
 Tire, wheel.....O. J. M. Ancora  
 Tool holder.....G. R. Sherwood  
 Track cleaner.....G. W. Ruggles  
 Traction engine.....R. Russel  
 Tree extractor and carrier.....A. U. Dunbar et al  
 Trolley wheel.....G. B. Raum jr  
 Truck, elevator.....G. J. Peacock  
 Tube cleaner.....W. S. Elliott  
 Tube ends, tool for brushing.....E. T. Greenfield  
 Tube testing machine.....F. Deming  
 Tubing manufacturing machine.....V. Royle  
 Turbine, steam.....J. Burghum  
 Turnstile.....A. P. Dodge  
 Type bars for printing.....F. E. Bright  
 Umbrella holder.....J. A. Dawson et al  
 Umbrella runner.....F. D. Ingrem  
 Valve.....C. Gulland  
 Valve, inflation.....E. S. Rooney  
 Valve, pressure-regulating.....G. Kettenring  
 Valve, slide.....I. N. Moore  
 Valve, vessel.....C. A. Borein  
 Vehicle brake.....A. L. Parker  
 Vehicle, electric.....E. A. Sperry  
 Vehicle footboard.....H. Dhuse  
 Vehicle footboard.....J. W. Eisenhuth  
 Vehicle seat fastener.....J. A. Cros et al  
 Velocipede steering head.....G. L. Thompson  
 Vending machine, coin operated.....J. T. Sibley  
 Wagon brake.....G. Newton  
 Wall covering, metallic.....G. Russell  
 Washing machine.....J. W. Thomas  
 Water closet, disinfecting.....W. Ruthven  
 Water motor.....H. A. Wise  
 Water raising apparatus.....L. H. Woolley  
 Water tube boiler.....G. M. Davis  
 Water tube boiler.....T. French  
 Wave motor.....C. F. A. Roell  
 Weather strip, door.....A. G. Ogan  
 Web printing machine.....F. Meisel  
 Weevil, destroying cotton boll.....F. Strobach  
 Wheel for bicycles.....E. A. Crossley  
 Whistle, self playing.....A. Leech et al  
 Wind and water motor.....R. E. Hardaway  
 Windmill.....J. O'Toole  
 Windmill tower.....H. Woodmanse et al  
 Window frame and sash.....A. Rasner  
 Window screen.....R. M. Spencer  
 Wire, making seamless.....F. E. Bodman  
 Wood working machine.....J. Smith et al  
 Wood working machine.....J. R. Thomas  
 Woven fabric.....C. W. Gilbert et al  
 Wrist pins, device for truing.....T. Corwin  
 Writing translating secret.....J. W. Follansbee  
 Zinc, making chlorid of.....H. K. Hess

## DISBARMENT OF ATTORNEYS.

The following named attorneys have been disbarred from practice before the U. S. Patent Office.  
 E. Bee Guthrey, Perry, Okla.  
 Benjamin F. Harrison, Nashville, Tenn.

## German Echoes from Phila. Exposition.

(Continued from page 5.)

pectedly successful, and will exert an important influence upon the immediate future of international commerce. The German delegates were surprised by the numbers and high character of the representatives of other nations, particularly those from Great Britain, South and Central America, Australasia, and eastern Asia. They were intensely interested in the display of commercial samples from foreign countries, but think that, in consequence of the rapid change in styles and models, these will have for the most part only a temporary value. On the other hand, they have found the Bureau of Commercial Information at Philadelphia a model of completeness and efficiency, far in advance of any other institution of its kind yet organized in Europe, and a model for the immediate imitation of Germany and other exporting nations which hope to maintain their place in future competition. The recent address in Berlin of Dr. Vosberg-Rekow, director of the association of German business men for the preparation of commercial treaties, was emphatic on this point, and an important meeting will be held on the 15th instant to discuss the part which the Imperial Government will be asked to take in supporting such an enterprise. The annual meeting of this powerful association, which acts as a purveyor of technical and commercial information for the Government, is fixed for the 19th and 20th of December. The principal topic before the meeting will be the proposed creation of a commercial museum and bureau of information, to be organized and managed on lines similar to those of the same institutions at Philadelphia.

Dr. Vosberg-Rekow's declaration that he had critically examined the processes of meat inspection and preparation at Chicago, and had found them admirable, is the first official testimony of that kind which has been able to check and silence—for the moment, at least—the long-sustained and tedious chorus of agrarian denunciation of American food products. His address was delivered before the Berlin Association of Merchants and Manufacturers, the members of which are generally men of superior intelligence, who are above the small jealousies and selfishness of trade and who realize how dependent are the industrial and laboring classes in German cities and manufacturing districts upon imported breadstuffs and meats.

In the course of his address, the speaker described his visits to American manufacturing establishments, and said:

"When you read the figures which mark the present condition of industry and trade in the United States, you will conclude that they are smart fellows over there, and we must bestir ourselves, if we hope to keep up with them."

When one examines the industries of America, one is amazed by the gigantic strength, the pristine power of that people, and realize that Americans will play henceforth an important role in the economic affairs of the world. Nevertheless, a nearer examination shows that the development of American industry is not symmetrical or complete; there are gaps and points of weakness here and there. One industry may be very highly developed, while a correlative branch is primitive and neglected. One notices that American manufacturers are generally not broadly educated, though they are skillful and well informed in their separate specialties. They are highly original and ingenious, and when they seriously take up any special branch of manufacture, they soon explode and supersede the older methods of Europe. For all this, we need not greatly fear the Americans. Their training is too incomplete and one-sided to render them successful competitors in the long run."

Similar in tenor and deductions was the report of Herr Wirth, a linen manufacturer of Sorau, who had attended the exposition as the representative of the chamber of commerce in that busy city. In his report, which was delivered before a special meeting a few days ago, Mr. Wirth confirmed the principal observations of Dr. Vosberg-Rekow, described the impression made upon him by the great factories of Pennsylvania and New England, the four-tracked railway lines crowded with traffic, and the resistless energy and enterprise of the people. "Great as industrial Germany has become," said the speaker, "she is yet far behind the Republic in natural resources and productive capacity." All that he saw emphasized the importance of closer and more friendly relations between the two countries, whose exchanges of raw materials and certain manufactured products are essential to the prosperity of both.—Extract from the Report of Consul General Mason to the State Department.

## Shorthand Typewriter.

One of the newest things at the National Export Exposition, Philadelphia, was a short-hand typewriter, which was exhibited in the east end of the north pavilion. It proposed to dispense with the services of stenographers, replacing them with cheaper men, who would use this typewriter to take dictation and then transcribe it on an ordinary typewriter. It was a very small affair, and printed crosswise on a paper tape. The operator used all his fingers at once, and struck out a whole word, or so much of it as could be done with both hand. The words appear one under the other along the paper tape. It attracted much attention from persons directly or indirectly interested in correspondence.—Age of Steel.

The largest electric mining plant is at Cripple Creek, Col. Cost \$2,500,000.

## PATENTS

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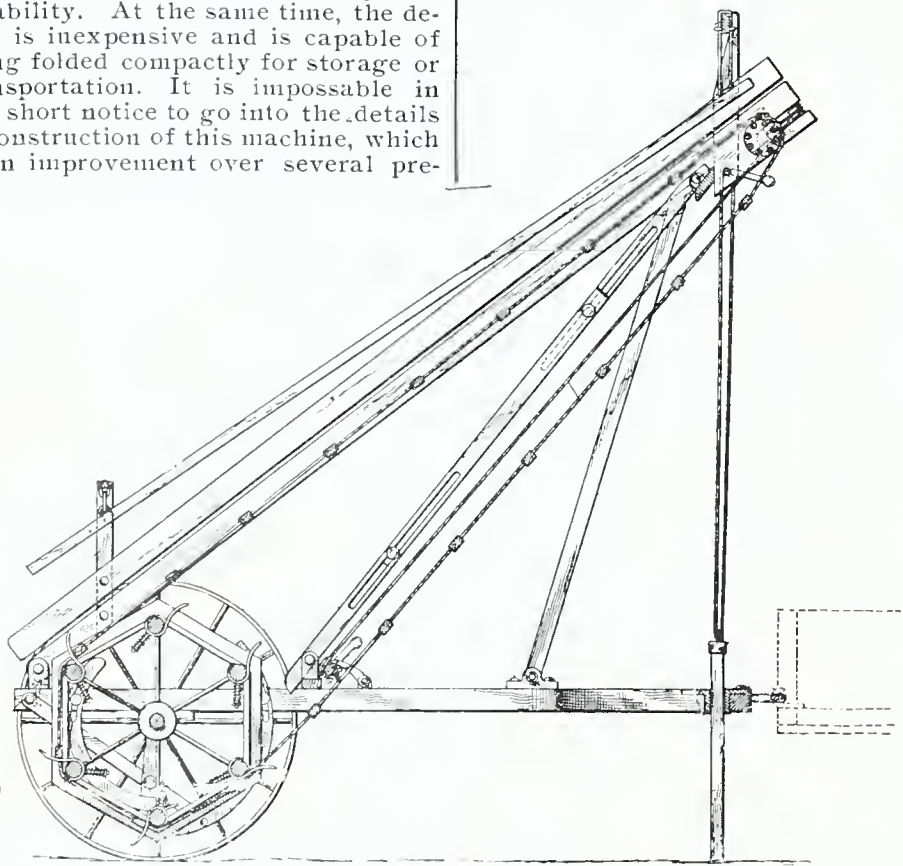
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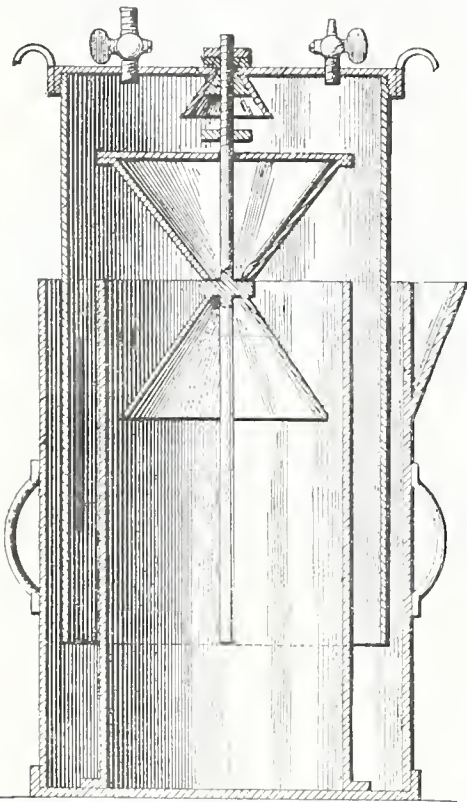
## RECENT PATENTS.

The present illustration is the latest improvement in hay loaders patented by Samuel Ferguson, of Hazel Green, Iowa. Mr. Ferguson has made a life study of this art, and has finally succeeded in producing a machine that cannot be excelled for efficiency and durability. At the same time, the device is inexpensive and is capable of being folded compactly for storage or transportation. It is impossible in this short notice to go into the details of construction of this machine, which is an improvement over several pre-



vious patents granted to the same gentleman. It may be said however, that, as shown in the illustration, the machine is designed to be attached to the end of a hay wagon and consists broadly of a rotary drum on which is carried a series of picker fingers. An endless carrier runs from the drum to the upper part of the framework which may be adjusted to any height desired. As the drum rotates, the fingers automatically pick up the hay and deposit it on the carrier which elevates it on to the wagon.

Another noteworthy invention is that of Mr. Hilliary Eldridge, of Galveston, Texas. This is in the line of Acetylene Gas Generators, an art that has grown up within the last three or four years and has reached immense

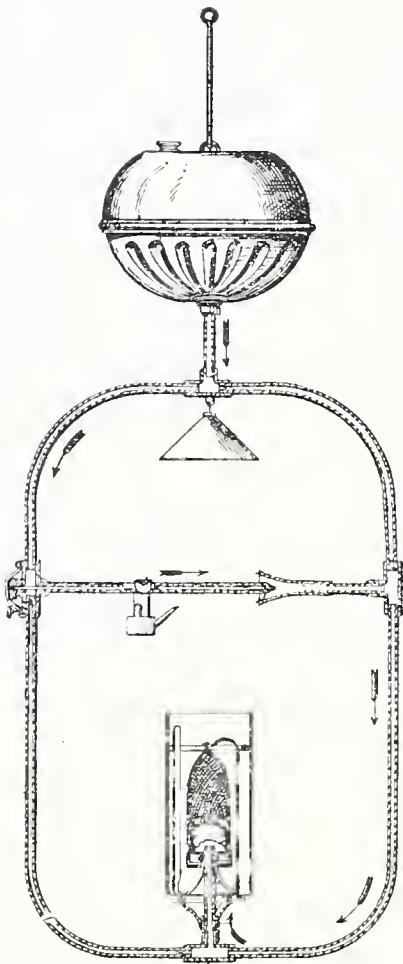


proportions in that short space of time. While Mr. Eldridge has contributed before to this art, the present invention is an exceptionally great improvement providing as it does, a safe, reliable generator that can be used for a table lamp as well as where a large supply of gas is required. The view herewith

shown is a sectional view of the preferred form. It consists of a rising and falling bell gasometer which carries an inverted cone-shaped carbide holder. When the ball sinks, the upper edge of the carbide holder rests on the top edge of the inner wall of the tank, and as the bell continues to sink the valve at the bottom of the holder opens, the carbide feeds out over a deflector and into the water. The gas

generated causes the bell to rise and stops the carbide feed. This is the general operation of the machine and it has many advantages over the many machines in use.

Still another art that is coming to the front and one that is a serious rival of the acetylene gas, is the vapor burner, wherein a gas or vapor made from hydro-carbon is burnt for illuminating purposes. As a recent improvement in the art, the patent to Mr. Wm. Scott of Kansas City, Mo., embodies

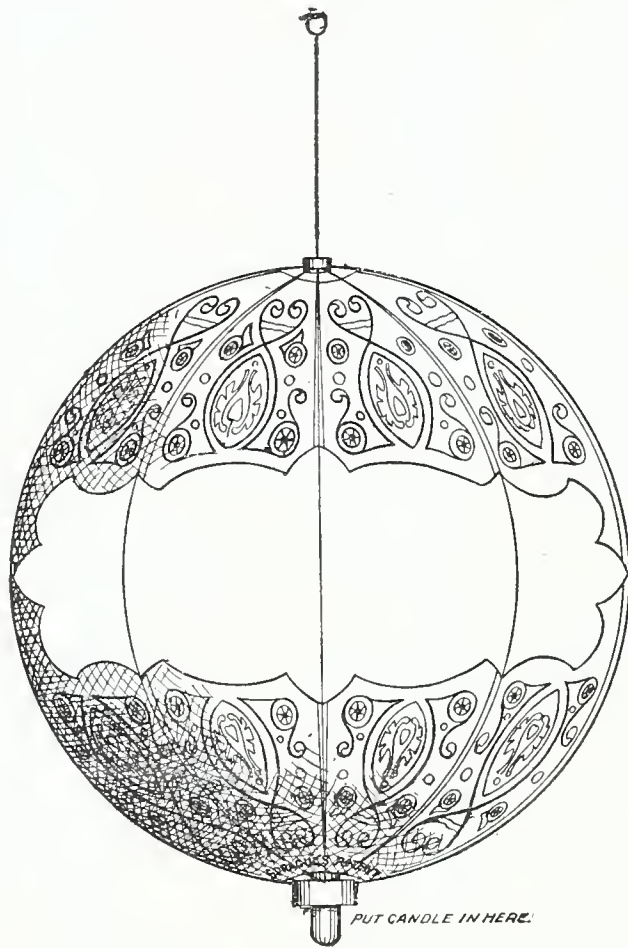


a construction that is cheap, efficient and absolutely safe and that can hardly be improved upon. As shown in the accompanying illustration, it consists of a tank and series of piping that lead to a burner. The oil is led down from the tank, then across above the burner, where it is vaporized by the

heat from the same, and at the same time mixed with air. From this point the vapor is conveyed to the burner where it is consumed under an ordinary "Welsbach" mantle, thus making a brilliant white light. To start the device, a small alcohol lamp is attached to vaporize the oil until the burner is started. It is obvious that the device may be used otherwise than in a hanging lamp as shown, and this simple means provides a cheap brilliant light equal to that given by an electric lamp and having a wide range of usefulness.

## SPRAGUE'S PATENT LAWN ILLUMINATORS.

We desire to call the attention of our readers to Sprague's Patent Lawn



Illuminators as shown above. They are used as lawn or porch lanterns. Various sizes are made, with ribs 15 in., 24 in. and 52 in. long.

The inventor, Col. Jas. H. Sprague, is the President of the Sprague Umbrella Company of Norwalk, Ohio., which company make and sell Col. Sprague's inventions. Col. Sprague is a very prolific inventor and has more patents pertaining to umbrellas and kindred subjects to his credit than any man in the world. None of his patents are for sale, and a commodious waste basket in the Colonel's office receives all fake proposals to sell his patents. Col. Sprague conducts a very large and profitable business and is one of the few men who make patents pay.

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## Invention Wanted in Java.

I wish to call attention to the fact that a new problem, and so far an unsolved one, is appearing in connection with the sugar trade of this colony. It is of special interest to Americans, as in the last two seasons at least seven-tenths of the sugar crop of Java went to the United States. It is the question of packing sugar.

At present, sugar is packed in cases made of matted bamboo straw, and it has been found to be the ideal packing, far superior to the grass mats used for Philippine sugar. Unfortunately, owing to improvident methods and neglect of government supervision, the bamboo is showing signs of giving out, and experts predict that the time is not far distant when it will be so scarce as to become too expensive to use in packing sugar, in view of the present small margin in the profits of sugar planting.

In some districts, there have been government officials who had foresight enough to compel the natives to plant a new tree as soon as the old one was cut down; but unfortunately such cases were few and far between, with the result that many districts of Java are now almost entirely denuded of bamboo.

Consequently, the planters are casting round for a material to take the place of bamboo matting. So far nothing has been found that will answer. Jute is unsuitable.

A gentleman here who is largely interested in sugar plantations, with whom I was talking the other day, told me that anyone who could invent something satisfactory would make a fortune in Java alone, as his method would be at once used by every planter. Inasmuch as the sugar exports for last year were 689,542 metric tons, it can readily be seen that it may be worth someone's while to try.

Let an inventor acquainted with sugar and its properties set his brains to work to see if he can not evolve something that will meet the situation I have described. Let him, however, bear in mind that what might be suitable packing for Cuban sugar would not necessarily do for Java, as this sugar has a much longer sea voyage to undergo, and must be much more carefully protected.

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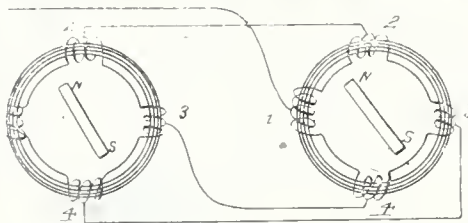
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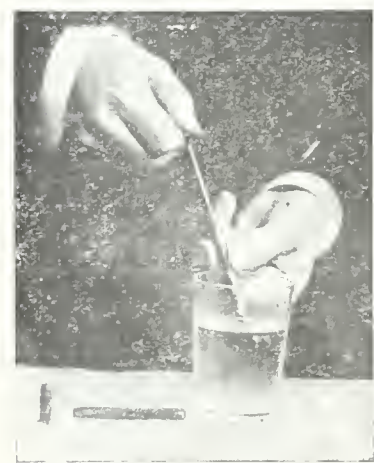


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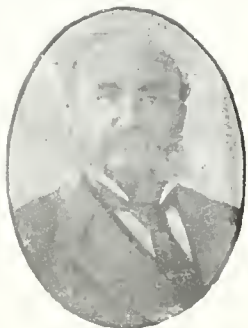
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*Lew Wallace*

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# The Inventive Age

## AND PATENT INDEX.

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No. 2.

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### U. S. PATENT OFFICE.

#### DIVISION VII.

One Of The Oldest In The Patent Office: Originally Started for Harvesters: Now Devoted To Bicycles. Perpetual Motion Cranks Turned Down.

Division VII, as such, is one of the oldest divisions in the Patent Office. It appears to have been originally instituted particularly for the examination of applications for harvesters. Other work from time to time was added or taken away, and by the Commissioner's order dated Aug. 5, 1892, the subclass of Velocipedes in the class of Carriages and Wagons was abolished, and the class of Velocipedes established and made a part of the work of this division. The division then had three classes, namely: Harvesters, Velocipedes and Games and Toys. The receipts in the number of applications in Velocipedes increased to such an extent that in 1895 it was found necessary to get rid of Games and Toys. This was followed on June 4, 1897, by the transfer of the class of Harvesters to Div. V. This left the division with but one class: namely, that of Velocipedes. It was, nevertheless, the largest division in the Office in the number of employees and in the number of cases received. The history of receipt of applications for Velocipedes in this Office is somewhat curious. Prior to the establishment of the class so named there were comparatively few and had been limited in the early history of the art to what were then considered children's toys. Upon the establishment of the class the patents were divided into five groups as follows: Unicycles, Bicycles, Dicycles, Epicycles and Polycycles. The characteristic feature of all patents in the class of Velocipedes is that they must be hand or foot propelled, or that they must relate to parts of

such vehicles (except wheels and tires) so propelled. Unicycles relate to one wheeled vehicles; dicycles to those placed cart-like side by side; epicycles to those which constitute what may be termed a wheel rim travelling on the ground and propelled forward by suitable mechanism within and travelling upon it; bicycles and polycycles are terms too well understood to need a definition. Of course, the greatest receipts for many years have been in the subclass of bicycles. While this has been subdivided into the two groups of ordinary and safety bicycles, the receipts of applications relating to the old, or ordi-

has by these means been increased perhaps three-fold. In the year 1899 about two thousand applications in this class became abandoned. It will be seen, therefore, that the class of Velocipedes, like many others, has experienced a period of growth followed by a decline, and it is believed by the examiner in charge of this division, that the application receipts have about reached a normal stage. In the period of two or three years ago when the bicycle craze, so-called, was taking a strong hold on the world at large, it was natural that many persons should turn their attention to possible improvements. Since, however, the art has now assumed the

all sorts, cards and card games, toys of all kinds and even the elaborate and expensive merry-go round. Man must be amused, and no doubt our prehistoric ancestors even found time like modern aborigines for games of chance or skill of some rude sort. The records go to show that playing cards of some form have been known in Asia for centuries, possibly anterior to the Christian era. They have been known particularly in China and Hindoostan. The most notable improvement in this particular art perhaps is the indicators in the corners of the cards. The man who invented these is said to have made a large fortune from his inven-

tion. Just now Div. VII is experiencing a "run on golf," and the examining force is worrying over a series of applications disclosing all sorts of odd expedients for preventing the loss of a ball, or for adapting a club to be used for strokes of several kinds or for other expedients designed to shorten the labors or sweeten the pleasures of the golfer. A peculiar question often arises in the discussion and examination of game boards and similar devices. Thus an inventor may vary the design upon the surface of a game board so as to adapt it for a game different from the original one. So long as the structure remains unaltered, however, a mechanical patent will be refused since the difference is of an artistic and intellectual rather than



DIVISION VI, UNITED STATES PATENT OFFICE.

nary structure, have been reduced to almost nothing.

The increase in bicycle applications became marked July, 1895, and reached its maximum in June, 1896, in which month 280 cases were received. There has been a gradual decrease, the present receipts not differing greatly from those in 1894. The examination, however, is attended with many more difficulties than that which characterized applications filed six years ago. About 3000 United States patents have since then been added to the art, and more than that number of foreign patents. The field of search

steady position of an assured industry, and bicycles themselves have become a means of conveyance common every where, and of, practically standard types, there seems to be no reason to anticipate any departure from the usual rate of progress attending an established art.

Another class now restored to Div. VII is that of Games and Toys. This class is broad in its scope, including all sorts of amusement devices from an infant's rattle to a golf expert's mallet. It includes sporting devices of all kinds, billiards, base-ball, tennis, bowling alleys, tricks and puzzles of

of a structurally inventive character.

A third class recently transferred to this division is that of Mechanical Motors. This is intended to include all mechanical devices for transmitting energy, such as horse-powers, treadles, weight and spring motors, &c. The examiners in dealing with this class run against the "will-of-the-wisp" known as perpetual motion. It has been the custom of the Patent Office for many years to refuse at first to receive a fee for an application or caveat for a perpetual motion machine. Upon the receipt of an application, for instance, alleging to disclose such a





ACTING EXAMINER CHAS. C. STAUFFER.

motor, a circular letter is sent to the applicant stating that the invention is considered impracticable and returning his fee. He is warned that, if he desires to return this, it will be accepted, but that a working model must be at once required. Sometimes this ends the matter, but in many cases, the would-be inventor becomes indignant at what he believes to be an officious interference with his rights, or perhaps an attempt on the part of some official to steal his marvelous secret and persists in his demand for the acceptance of his fee. The case is then forwarded to Division VII and a working model called for, which of course ends the matter. Another class of these cases are those in which the perpetual motion idea is concealed in some adroitly figured mechanism. The examiners are, however, expert in detecting fallacies of this sort and ruthlessly turn down many ambitious inventors who are attempting to violate the law of the universe by creating something out of nothing. Energy has never been created except by Omnipotence in the first creation of all things, but the idea of creating some form of energy by a device securing perpetual motion pertinaciously survives reason and ridicule alike. Of course experienced mechanics can perceive at once the fallacy of most of these schemes, but the art of Div. VII, particularly in the foreign patents, reveals many curious attempts at the solution of the apparently impossible problem. As far back as 1630 a British patent was granted for some such device. Papers were read before the scientific societies, eminent men believed religiously in its possibility, and during the time of the South Sea excitement in the last century, an attempt was made to float a company for the exploitation of an invention of this sort. There were many subscriptions.

A fourth class in this division is that of clutches. This includes, as its name indicates, devices for securing a pulley to a shaft or of joining two parts together so as to make them, rotate as one. The class, though small, is important from its general relation to all mechanical arts.

Mr. Chas. C. Stauffer the acting examiner of this division is a man of varied experience in the Office having served as assistant examiner in the wood-working, printing, chemical and metallurgical divisions, and through two administrations as law clerk. He is a college graduate. The assistants are Messrs. Geo. P. Tucker; Will J. Becker; Alan M. Johnson and Walter A. Holden. These gentlemen are all men of experience in the Office, are members of the bar and are all highly educated college men. Mr. Tucker is a graduate of Worcester Polytechnic Institute and a member of the American Chemical Society. Mr. Becker graduated with the degree of Mechanical Engineer from the Royal Bavarian Polytechnic of Munich. He also took courses at the Federal Swiss Polytechnic of Zurich and at the Royal Prussian Polytechnic at Aix-La-Chapelle. Mr. Johnson is of St. John's College, Annapolis, and Mr. Holden, of Yale.

#### Search for Water with the Divining-Rod

The use of the so-called divining-rod for the discovery of hidden springs or underground watercourses is about to be scientifically investigated. A commission has been appointed in France to study all apparatus and methods employed by sorcerers, "water-seers," wizards, and all specialists in occultism, in the discovery of water in other ways than by those recognized in geology and hydroscopy, such as the divining-rod, exploring pendulum, hydrosopic compasses, magnetic and electric apparatus, etc. The president of the commission is M. Brothier de Rolliere, a French engineer. Says *Cosmos*: "To get at the truth, M. de Rolliere will procure, seek, and collect all devices, works, reviews, journals, experiments, reports and observations for and against the divining-rod and other like apparatus, with names and addresses of the authors or inventors; he will put himself in communication with all persons who have experimented or written on the subject, with a view to holding a meeting of them, and clearing up, if possible, these cloudy questions that ought to be treated in public."

"He wishes, therefore, to collect the largest possible number of addresses of sorcerers' and wizards. It is said that these exist everywhere, in France and Europe; but when they are sought, they can not be found. It would, nevertheless, be very interesting to know them; for if their science is exact, they will, of course, find lucrative employment and will render valuable service. If their knowledge is worthless, it will be so proved, and people need no longer employ them. M. de Rolliere therefore makes an appeal to all persons, in France and elsewhere, to furnish him with the necessary documents in great number. We take great pleasure in making known a request which will interest all students of science, both theoretical and applied." All facts or documents for M. de Rolliere may be sent to the office of *Cosmos*, 8 Rue Francios Premier, Paris. It may be doubted whether scientific hydrosopy will gain much from this inquiry, but it ought to bring out a rich collection of facts for students of folk-lore, the psychology, of superstition etc."—The Literary Digest.

## IMPORTANT COURT DECISIONS IN PATENT CAUSES.

### COURT OF APPEALS

#### OF THE DISTRICT OF COLUMBIA.

HUBEL v. BERNARD. Decided December 6, 1899.

#### 1. INTERFERENCE—ORIGINALITY—EMPLOYER AND EMPLOYEE.

Where Bernard employed Hubel to make the device and pointed out the distinctive and dominating features of his improvement, but did not make anything resembling a perfect drawing for his guidance or describe the proposed construction in detail, *Held* that Hubel is not entitled to claim the invention, although by reason of his mechanical skill he has made a neater and more perfect device than was in the mind of Bernard.

#### 2. SAME—MECHANICAL SKILL OF EMPLOYEE.

An inventor who employs a mechanic to embody his conception in practical form retains his exclusive right to the perfected improvement notwithstanding the perfection is partly due to the exercise of the mechanical skill of the employee. The latter must invent something, not merely improve by the exercise of his mechanical skill upon a conception which he has been employed to work out. (*Agawan Co. v. Jordan*, 7 Wall., 583; *Milton v. Kingsley*, 75 O. G., 2193.)

#### 3. SAME—PRIORITY.

*Held* that the evidence on behalf of Bernard has overcome the burden of proof imposed upon him by the earlier application of Hubel and has successfully established his claim to the award. The decision appealed from affirmed. (67 MS. Dec. 26.)

### U. S. CIRCUIT COURT OF APPEALS. SECOND CIRCUIT.

WELSBACH LIGHT CO. VS. THE AMERICAN INCANDESCENT LAMP CO. AND J. BERLINICKE. Decided December 7, 1899.

#### 1. RAWSON—INCANDESCENT MANTLES—VALIDITY.

Claim 1 of Letters Patent No. 407,963 granted to Frederick L. Rawson and William S. Rawson July 30, 1889, for an improvement in the production of incandescent mantles, *Held* to be valid.

#### 2. PATENT—FOREIGN PATENT—INFRINGEMENT—DEFEATING UNITED STATES PATENT. EFFECTIVE DATE OF FOREIGN PATENT.

An infringer cannot defeat Letters Patent of the United States to an original inventor in a foreign country by proof that before the date of a prior foreign patent to the same inventor, but not before the date of the application for such patent and less than two years before the date of the application for a United States patent, the invention was used in this country by a person who did not invent it.

#### 3. SAME—SAME—SAME—"DATE OF INVENTION" IN SECTION 4886, REVISED STATUTES, CONSTRUED.

Section 4886, Revised Statutes, applies to all inventions, irrespective of the place of their origin, and the term "date of invention" is used without discrimination between classes of inventions. The language of the section refers to the actual and not to the artificial date.

#### 4. SAME—SAME—SAME:

As against an infringer a patentee in a United States patent for an invention previously made by him and patented in a foreign country may, to avoid alleged use in this country by an infringer before the date of the foreign patent, show the date of the application for the foreign patent for the purpose of showing the actual date of his invention in a foreign country.

### DECISIONS OF THE COMMISSIONER OF PATENTS.

IN RE TROPENAS. Decided December 13, 1899.

#### 1. APPLICATION—SUBSTITUTING APPLICATION EXECUTED BY APPLICANT FOR ONE EXECUTED BY ATTORNEY—CHANGING DATE OF APPLICATION FOREIGN PATENT.

A petition, specification, and oath executed by an inventor on October 26, 1899, before the United States Consul-General at Paris cannot be substituted for the petition, specification and oath executed by the Attorney in fact of applicant, which latter papers were deposited in the Patent Office, October 27, 1899, for the purpose of giving the date October 27, 1899 to the application so that the applicant will not forfeit his right to obtain a valid patent under section 4887, Revised Statutes, by reason of a prior foreign patent, as the power to make such substitution is not vested in the Commissioner of Patents.

#### 2. SAME—SAME—SAME—PLACE OF FILING APPLICATIONS.

The application executed by applicant before the United States Consul-General on October 26, 1899, can be of no assistance in giving applicant a date of filing earlier than the actual date of the receipt of the application papers in the Patent office. There is but one place in which an application for a United States patent can be filed and that is in the United States Patent Office. The papers executed by the attorney cannot be treated as forming any part of a valid application.

#### 3. SAME—SAME—INVALID PATENT.

A patent issued upon such substitute papers as presented in this case would be invalid, for the reason that the application for the patent must have been made by the inventor not later than October 28, 1899; but no application was made by him until November 11, 1899.

EX PARTE GASSMANN. Decided December 18, 1899.

#### 1. DIVISION—PRODUCT—GENUS AND SPECIES.

Where a set of claims can be based upon one specific product, there is no reason why they should not be permitted to remain in the same application. Claims so drawn are drawn in accordance with the doctrine of genus and species.

HUMMEL VS. TINGLEY. Decided January 9, 1900.

#### 1. REFERENCE, BURDEN UPON APPLICANT TO SHOW DATE OF.

Where the Primary Examiner cited a foreign patent as being a pertinent reference, as it appeared upon its face that it was issued at a date prior to the filing date of the application under consideration, and it was contended by applicant that the foreign patent was not granted at the date shown on its



face, *Held* that when the foreign patent was cited the burden was shifted on applicant to prove the said foreign patent was not entitled to a date which made it effective as an anticipatory publication.

2. SAME,

Held, further, that the question is analogous to that raised by the citation of a prior patent to negative patentability of an invention claimed by an applicant. In that case the burden is upon the applicant to show that such prior patent does not disclose his claimed invention. (*Durham v. Seymour, Commissioner of Patents*. 71 O.G. 601.)

## RECENTLY PATENTED INVENTIONS AND DESIGNS

Procured through the Patent  
Soliciting Department of E. G. SIGGERS.  
Washington, D. C.

Marshall M. Cram, Mankato, Minn. Boiler Cleaner.—By means of a series of conduits placed in the inside of a boiler and having means whereby they may be moved back and forth from one end to the other, the boiler may be thoroughly cleaned from sediment, scale and other impurities, the same being ejected through the conduits by the pressure developed in the boiler. By this means an effective cleaner is provided that can be installed in a boiler at slight expense.

Noah Early, Jr., Warrensburg, Mo. Gate.—This is a farm gate of improved construction having operating mechanism, whereby it may be opened and closed by persons on horseback or in vehicles, without the necessity of such person dismounting. The several parts are simple in construction, so that their broken parts can be easily replaced, and the whole device is a great improvement in the art.

Benjamin F. Kent, Eugene, Oregon. Lamp Bracket.—This invention relates to improvements in supporting brackets for lamps and by the construction a device is provided for supporting either electric, gas or other lamps in any desired position. It consists substantially of a pivotal arm to which is attached a lazy tongs, the latter carrying at its outer end an adjustable supporting arm. Suitable conveyors are provided for the illuminating agent, the whole forming a very useful invention.

Thomas Kuzel, Buckholtz, Texas. Evaporating Furnace.—The object of this invention is to make a cheap and efficient furnace particularly adapted for evaporating the juice of sugar cane, although it may be used in the manufacture of maple sugar or the like. It consists of a series of trays forming a top for the furnace, and two distinct smoke passages underneath in combination with a series of dampers, by means of which the heat under the pans may be easily regulated as desired.

Denton Simpson, Centre, Indiana. Corn Dropper.—This is an improvement in the dropping mechanism for corn planters, and consists substantially of an oscillatory dropping wheel arranged in an opening in the bottom of the seed box, an oscillatory actuating drum having suitable means for operating it and flexible connections between the drum and dropping wheel. This provides a new and useful mechanism which positively and without injury drops the seed through the spout.

Rufus F. Sprague, Greenville, Mich. Potato Planter.—A pair of beak-jaws

are pivoted together, one of the jaws being provided with a handle, and the other having an adjustable foot rest, which also serves as a gage. The beak is forced into the ground by means of foot pressure and opened to release the potato confined therein and is then withdrawn. The device is a decided improvement in the art.

Edward H. Walker, Dumas, Miss. Animal Trap.—A trap which is always set and in which the bait is entirely protected from the animal, is the subject of this invention. It is made of wire, and consists of a circular runway arranged around the bait receptacle, but separated therefrom. A removable door which opens into the cage but not outwardly, allows the animals to enter but prevents their egress. The trap will catch a large number of animals without replenishing the bait, and it may be easily converted into a fish trap if so desired.

Warren C. Patterson and Andrew J. Flynn, Tamaqua, Pa. Design for Railway Rail Chair.—An oblong flat base, having one of its ends rounded, is provided upon its upper surface with a tapering lug, which terminates at its upper end in a vertical lip. This fits snugly against the rail and holds it securely in place. The device being of one piece is strong and very inexpensive.

Fleming C. Rawley, Dublin, Ky. Design for Meat Hook.—This is a novel design which is as useful as it is inexpensive. It consists of a single piece of wire, coiled at its central portion and having its ends formed into oppositely arranged hooks. A stay connects the hooks and forms a strengthening bar for the same. While it is especially adapted to meat hooks, it may be used for many analogous purposes.

Gideon S. Adams, Camden, N. J. Combination Tool.—The present invention provides an exceedingly practical tool, combining in its structure, a wrench, a pipe cutter, a claw hammer and a hack saw, all of which are conveniently arranged, and do not interfere with each other during the manipulations of any one. The device will find great favor especially among plumbers and steam pipe fitters.

Robert L. Breth, La Jose, Penn. Wheel.—The hub is made in two sections which screw together and clamp the inner ends of the spokes. The bore of the hub is provided with recesses which receive ball cups that are so constructed that the balls will be retained therein when the wheel is taken off the axle. By this construction a strong ball bearing wheel is provided, which reduces friction to a minimum and which effectually excludes the dust from the bearings.

John Rombach, Weston, W. Va. Measuring Faucet.—A registering attachment is arranged in the top of a measuring faucet and connected therewith, so that it registers the total amount of liquor drawn through the faucet without interfering with the functions of the apparatus. This makes a very useful device, as it not only shows the whole amount of liquid drawn, but affords an easy means of ascertaining the contents remaining in the barrel or cask.

Theophiel P. Walter, Beatrice, Neb. Corn Husker.—A metallic plate is bent to conform to the shape of the hand, and is fastened to a broad leather strap that is arranged to be buckled to the hand. A metallic hook is constructed so that it may be fastened to the metallic plate in different positions to suit the convenience of the operator, the whole making a very inexpensive and efficient device.

Stewart B. Bartley, Shawanee, Tenn. Design for Washing Machine Staff.—The leading feature of this design resides in a straight arm provided intermediate its ends with a flat circular enlargement and contiguous to said enlargement with a pair of spaced parallel pin extensions. This is arranged to be pivoted in the cover and carry a rubber at its lower end which automatically adjusts itself to the amount of clothing in the machine. This is a useful improvement and the machine should have great sales.

Albert J. Smalley, El Reno, O. T. Washing Machine.—A metallic tank is divided into two compartments and is provided with a false bottom having a communicating passage between the two compartments. Vertically reciprocating plungers mounted upon a cross bar operate in each compartment and force the water from one compartment to the other, and thoroughly cleanse the clothes placed therein. It is a great labor saver and presents many advantages over the ordinary machines of this character.

John L. McKay, Chicago, Ill. Design for Spoon Holder.—This is a very useful novelty, designed to hold a spoon and prevent the same from sliding into a bowl or other receptacle. It comprises a series of spring fingers which are adapted to engage the edge of a dish. At the upper end of these is arranged a spring clamp which engages the shank of the spoon and holds it from slipping into the bowl, at the same time, when wanted for use the spoon may be easily disengaged from the clamp.

Smith Abernathy, Keener, Alabama. Cattle Guard.—A series of parallel strips provided at their upper edge with staggered teeth, are arranged between and on the outside of the railroad rails. This simple arrangement effectually stops cattle or other animals from passing along the tracks or from one field to another.

Ira Boyd, Pond Hill, Pa. Washing Machine.—This device comprises a cylindrical casing within which is journaled a rotary rubber. A reciprocating pounder is arranged over the rotary rubber and is designed to be operated therewith, so that when the clothes are carried around by the rubber, the dirt is quickly pressed therefrom, and the clothes cleaned without injuring them.

Thomas Collier, Rienzi, Texas. Cultivator Attachment.—This is a new and useful planter attachment which can be easily applied to any ordinary type of riding cultivator, thus enabling the farmer to cultivate the ground and plant the seed at the same time, and besides the saving of time it obviates the expense of two machines, as the attachment is simple and comparatively inexpensive.

Eugene Fowler, Laurel, Del. Bicycle Support.—A pair of vertical standards are pivotally connected at their lower ends and are provided at their upper ends with means for attaching them to the rear forks of a bicycle. The support is provided with rollers so that the bicycle may be moved around as desired. This makes a very desirable support that can be used on any sized wheel.

Phoenix Gutleber, Liberty Corner, N. J. Fruit Gatherer.—A bag adapted to be attached to the operator is provided with a flexible chute. The upper end of the chute is attached to the end of the pole which carries a series of hooks that engage the fruit and cause the same to fall into the chute and thus be conveyed to the bag. A short chute is also arranged to receive fruit picked by hand. By means of this device, fruit may be picked at any distance from the ground and deposited in the receptacle without injuring or bruising it.

Morris T. Sharp, Mt. Vernon, Ohio. Tablet.—This tablet is intended for use in connection with telephones. It consists of a roll of paper attached to the telephone desk and adapted to be unrolled across the desk and detached as it is used. This is a very useful device and is of great convenience in receiving orders and messages.

George Millen, San Antonio, Texas. Ball Bearing.—A metallic hub is provided with outer and inner recesses and a central hollow chamber separated therefrom by intermediate solid portions. A pair of ball supporting collars are adjustably arranged on the spindle, the balls bearing against tapered caps placed in the hub recesses. By adjusting the spindle collars back and forth the wear is taken up, thus making a simple and efficient ball bearing hub.

Edward E. Taft, Mt. Pleasant, Iowa. Gutter Trough Hanger.—This hanger is made of two sections, one of which passes around under the trough, the ends being interlocked with the other section which passes across the top forming a brace. Suitable means are provided for attaching it to the eaves of a building. By this construction a hanger is provided that rigidly holds the gutter in the desired position, that can be easily adjusted or tightened and at the same time braces the gutter.

John L. Taylor, West Superior, Wis. Fifth Wheel.—By means of this invention, the use of king bolts is dispensed with. The device consists of two circular sections, one of which is attached to the axle, the other being fastened to the spring block. These two sections interlock, one being made of two pivoted parts so that it may be readily separated from the other section. This is a great improvement in this line, the parts being strong and durable, and enabling the several parts to be quickly assembled and disassociated.

Robert Wylie, Brooklyn, Iowa. Checking and Unchecking Device.—By means of this invention a horse can be unchecked by the driver without the necessity of his leaving his seat. It consists substantially in a pivoted lever over which the check rein passes and to the ends of which is attached an adjusting rein that runs back to the vehicle. The driver has only to throw the lever to allow the check rein to slide over on to the rein, and over which it can be easily drawn back. This device not only is a great convenience, but becomes an actual necessity where the animal driven is of spirited character.

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# *Inventive Age*

## AND PATENT INDEX.

Established 1889.

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WASHINGTON, FEBRUARY, 1900.

An instrument devised by Mr. E. F. Nichols has been used at the Yerkes Observatory to measure the heat of the stars. With the apparatus properly arranged a deflection is given by a candle 15 miles distant.

In this number of the INVENTIVE AGE, appears the first of a series of illustrated articles on Sewage Irrigation. As the question of sewage disposal is becoming one of the vital questions of the day it is believed that these articles will be highly appreciated. No expense has been spared in their preparation, and the sources from which the subject matter has been obtained is reliable in the highest degree. The information will be of a character not heretofore generally brought out and will show the work being done and experiments made in this line.

#### Widening the Suez Canal.

The Suez canal is now much wider than it used to be. There are now numerous sidings where ships can pass each other and the result is that the passage can now be made in 17 hours instead of 48 hours, the electric light enabling progress to be made by night as well as by day. There is to be an immediate increase of depth to 27 feet 10 inches and an ultimate deepening to 32 feet 9 inches, so that the largest vessels may use the canal. These improvements have greatly enhanced the value of canal shares.

#### Spoken Language.

President W. W. Skeats of the modern language associations in London recently declared that instructors should not forget that the spoken utterances really constituted the word and sentence, and that the written characters were mere symbols convenient for recalling such words and sentences to the recollection. Hence he declared that teachers should pay careful attention to the actual pronunciation. Every one has experienced the faults of the other methods. Most people find it impossible to really learn a language except by going to the country where it is spoken.

#### Iron and Steel Exports.

As yet there is no evidence of a falling off in our exports of iron and steel. The value exported in 1899 was \$105,689,000 and the value of the corresponding imports was less than \$16,000,000. The value of iron and steel and their products exported in 1897 was \$62,737,000, and in 1898 \$82,771,000. There was a gain of almost 30 per cent in 1899 over 1898, due in part to the higher prices which prevailed during the first-mentioned year. The number of tons of steel rails sent abroad last year fell short by 122,000 tons of the number exported during the preceding year. But the smaller number of tons were valued at \$6,122,000 and the larger number number at \$5,838,000. There was a slight falling off in the number of tons of pig-iron exported, due possibly to the sharp advance in price.

#### Rise in Wages.

The report of Commissioner McMackin, of the New York Bureau of Labor Statistics, for 1899 contains statistics of wages paid which indicate the ebb and flow of prosperity in the last decade. The average amount paid in wages per annum from 1890 to 1899 was \$10,102,181. There was a steady increase from the middle of 1890 to the middle of 1893; a great loss in 1893-94; a gradual recovery in 1894-95 and 1895-96; a check to the improvement in 1896-97; a better condition in 1897-98 than had existed since 1892-93, and a record-breaking year in 1898-99. Or, taking the average of wage payments at 100, the figure 1890-91 was 98; for 1891-92 was 104; for 1892-93 it was 109; for 1893-94 it was 81; for 1895-96 it was 97; for 1896-97 it was 89; for 1898-99 it was 127. It would be interesting to compare this with the trend of political history during the same years.

#### Cost of Transportation.

Few people realize how much money has been spent in recent years with the object of reducing the cost of transportation.

Motive power has been made more efficient by reducing grades and straightening curves. Steel rails are used instead of iron, and their weight has been increased from 56 to 100 pounds per yard. Locomotives averaged a weight of 92,000 pounds in 1890, but now those weighing 225,000 pounds begin to be used. Six, eight and ten ton freight cars are no longer used, 30, 40 and 50 tons being the present capacity, and steel cars are being substituted for wooden cars to lessen the dead weight. The average number of tons in a train 10 years ago was 175, but at present it is over 226, and is constantly increasing. Tracks are doubled, tripled and quadrupled, and steel bridges are replacing wooden ones. These improvements are estimated to have effected a saving of \$100,000,000 in the one year 1899.

Electric capsules are one of the latest inventions. A combination of chemicals has been invented, and, according to the company that manufactures it, a three grain capsule of it put into an ordinary battery will yield enough electricity to run a sixteen candle power incandescent light for one hour.

#### Coal Mine Accidents.

About as many people are killed in the coal mines of the United States and Canada as have been killed so far in the South African war. According to an article in the Engineering and Mining Journal the number of persons engaged in coal mining in the United States and Canada is 400,000 and the number of miners killed in accidents in coal mines in 1898 was 993, or less than in 1891, when the killed numbered 1,076. In view of the number employed the mortality is less than is commonly supposed to characterize mining operations.

#### A Novel Legal Proposition.

Is the sale of perforated rolls used in mechanical organs, aeolians and other similar instruments, for the purpose of producing musical compositions, a violation of the copyright the composer may have on his compositions? The English Court of Appeals, in the case of Boosey vs. Wright, 1 Ch., 386, has decided this question, holding that the intention of the copyright act was to prohibit the sale of such copies of a piece of music as would appeal to the mind through the eye, and that, although the perforated rolls expressed the sheet music in a different form of notation, they are simply parts of the machines, and not copies of the sheet music, any more than the cylinders of music boxes would be. But the Court held that the marks to guide the performer, such as *andante*, *moderato*, etc., came within the copyright and could not be used.

The New Jersey Agricultural Station has made experiments to determine whether it is more economical to grind corn (kernels and cobs together) for milch cows than to feed the ear corn without grinding. In these experiments one cow was fed for twelve days ear corn which had been run through a fodder cutter, and another ears finely ground (corn and cob meal) After a transition period of five days the feeding was reversed; i. e., for twelve more days the cow which had previously been fed ear corn was given corn-and-cob meal, while the other which had received corn-and-cob meal was given ear corn. The yield of milk on corn and cob meal was 9.5 per cent greater than on ear corn rations. The butter fat in the milk was 4.9 per cent greater. The cows gained in weight owing to increased digestibility.

#### Cottons in China.

If our cotton manufacturers are to derive full benefit from the trade in China, they must study their market better. Mrs. Isabella Bird Bishop, an English woman, who has travelled extensively in China says that the chief objection to our cottons is that they are too thin to use for trousers or other outside garments, which are the only ones a coolie wears. They will not stand the wear in summer and they are too cold in winter. A yard of Chinese homespun cotton fifteen inches wide weighs over twice as much as a yard of our calico thirty inches wide, and will wear four times as long. A coolie will not buy a material which will last only a year when, for the same price, he can get one that will last three or four years and still be useful in the shape of rags. The Chinese also say that the width of our cottons are wrong, and that widths above fifteen inches cut to a waste. They complain, too, that the goods are shipped in wrappers whose colors are "unlucky," and that the calico patterns are coarse in style and are "more fitted for outside barbarians than for the refined tastes of a civilized people." Nevertheless our cotton trade with China has increased wonderfully since 1890.

#### Proposed Legislation.

The bill introduced by Representative McClellan of New York, the son of General McClellan, deserves more than passing mention. It was introduced for the purpose of relieving medical and dental practitioners from unjust burdens imposed by patentees holding patents covering methods and devices for treating human diseases, ailments, and disabilities. There have been, no doubt, instances where physicians and dentists were subjected to much annoyance, not to say persecution, by patentees claiming infringement of patents held by them, but we think that on the whole, neither profession has any real complaint against patents. France, Germany, Hungary, Italy, Austria, Russia, and other European countries have laws prohibiting the grant of patents on medical compositions, but we know of no country that goes as far as the McClellan Bill. The practice of the U. S. Patent Office for years has been to refuse to grant patents on medicinal preparations but if this bill should become a law, many meritorious inventions would be stifled in their inception. It is a fact well known to every doctor and dentist, that many appliances used in their respective professions, have been invented by laymen. Therefore, should the bill become a law, no contributions to the art of materia medica or dentistry could be expected from outside the profession. What would be the result? Each physician or dentist would have to rely on his own ingenuity to meet new conditions, with the result that while inventions would still be made, the ingenious would keep their inventions secret and monopolize them in their own practice. The uninventive professional man would have to get along with present appliances. Every doctor and dentist is now at liberty to purchase the latest invention, but with the suppression of patents and the introduction of secret processes and appliances, the whole profession would not move forward on uniform lines. While this might stir up the latent inventive ingenuity of a few, the fact that the reward of a patent was no longer in sight, would deter many from making costly experiments in developing new ideas. On the whole, the public would suffer by the absence of up-to-date appliances from the offices of many physicians and dentists.

No one would object to a bill which aimed to prevent the grant of a patent for any composition of matter adapted to be used in the treatment of diseases of man or beast, for it would simply be carrying into legal effect what is virtually the practice of the U. S. Patent Office, but to extend this prohibition to "any device adapted to be used in the treatment of human disease" appears to be beyond the scope of wise legislation. We predict that the bill will not be passed in its present form.

The Iowa Legislature is considering a bill raising the salary of the Governor to \$5,000 a year, and adding to it allowances equivalent to \$1,100 a year. Six Governors now receive more than \$6,100 annually. The Governors of New Jersey, New York, and Pennsylvania get \$10,000 each, Ohio and Massachusetts \$8,000, Kentucky \$6,500, and California and Illinois \$6,000 each. Vermont and Oregon only \$1,500.





## SEWAGE IRRIGATION

### PART I.

History of the Development of Sewage-Irrigation—The Climatic Distribution of Sewage Disposal Plants in the United States.

BY B. G. FOSTER.

The purpose of the present series of articles is designed to point out to municipal authorities and to American farmers, the fact that under certain conditions sewage may be utilized with profit, and to indicate in general terms and without going into abstruse calculations or using technical language, what may be done and what has been done in this line.

Owing to the rapid growth of urban population during the past few de-

themselves, thus rendering beneficial what is otherwise a source of danger to health.

The information herewith presented has been obtained almost entirely from the United States Geological Survey, that branch of the government having made thorough investigations in this very important subject. Especial reference should be made to a paper by Mr. George W. Rafter, which has been published by the Geological Survey and from which this matter has been extensively copied. In addition, the writer is under obligation to Mr. F. H. Newell, Chief Hydrographer of the Geological Survey for kindly placing at his disposal, the information embodied herein, and to Mr. H. A. Pressey, Assistant Hydrographer for information and for assistance in correcting and revising the subject matter.

The popular idea, not only with us here at home but very largely abroad, is and has been that anything and everything connected with sewerage and sewage disposal is of so vile a character that it must be kept entirely out of sight. Out of sight, out of mind, has been the universal principle thus far. The immense aggregation of population in cities, however, by forcing the subject upon the attention of urban communities, has served to

tion may be found in that country than elsewhere, although the Germans and the French have now extensive sewage-purification plants of a high order of excellence. Nevertheless it is true that a large proportion of the data of sewage disposal, as it exists today, must necessarily be drawn from English practice.

Sewage purification was first attempted in England about forty years ago. At that time extravagant and, in the main, essentially erroneous views were entertained as to the possibilities of its utilization in agriculture. Especially was this true as regards the manufacture of artificial fertilizers from the sludge of various chemical processes. Large investments of capital were made and concessions granted by towns to private companies, practically all of which were for processes of chemical purification. With very few exceptions these investments have all proved a dead loss. The purification of sewage by chemical treatment at a commercial profit has been found impracticable. In the meantime land processes, which have developed contemporaneously with the chemical purification processes, have in every sense held their own, until at the present time it can be said that under proper conditions a fair profit may be made

tion of crops. The relatively small flow of the streams, combined with the warm climate, renders sewage especially obnoxious if not properly cared for, so that considerations of health and comfort are added to those of increased land values due to complete utilization of the water supply.

The introduction of sewage irrigation in the West is more easily accomplished than in the East because of the general employment of water in agriculture. The first use of sewage in this connection in the West was probably at Cheyenne, Wyoming, in 1883. It has also been used at Colorado Springs and Trinidad, Colorado, at Fresno, Pasadena, Redding, Los Angeles, Santa Rosa, and Stockton, California, at Salt Lake City, Utah, and at Helena, Montana.

The great lack of water in the sub-humid and arid regions would naturally indicate a relatively large development of sewage irrigation in those portions of the United States. As a matter of fact, however, other conditions than mere shortage of water have controlled—for instance, the degree of advancement of the towns themselves—and we accordingly find, on the whole, more sewage irrigation and general purification in the humid East than in the subhumid and arid West. The Western towns are, nevertheless, advancing rapidly, and we may expect changes in the figures in the near future.

In the humid region there are sewage-purification plants in operation, actually building, projected, or built and abandoned, distributed by States as follows: Maine, 1; New Hampshire, 2; Massachusetts, 32; Rhode Island, 5; Connecticut, 7; New York, 33; New Jersey, 11; Pennsylvania, 5; Maryland, 1; West Virginia, 1; Louisiana, 1; Texas, 3; Ohio, 11; Michigan, 2; Illinois, 2; Wisconsin, 2; Minnesota, 1; a total of 120 for the humid region. In the subhumid there is 1 in Nebraska. In the arid region, Arizona has 1; Colorado, 4; California, 8; Montana, 1; Utah, 1; Wyoming, 1; or a total of 16. There are also six plants in the humid portion of the Dominion of Canada.

The foregoing figures indicate a total for the United States and Canada of 143. About 120 of these plants have been either built or projected in the last ten or fifteen years. This total includes, so far as can be learned, all the purification plants of every kind, whether irrigation, intermittent filtration, or combined chemical-purification and filtration and irrigation plants, either actually in operation now, or formally projected and in such a state of advancement as probably to be carried out in a few years.

It will be readily seen that there are marked differences between the conditions in this country and those existing abroad. In the first place, our streams are much larger, and so far as the production of mere effluvia is concerned, they can take larger quantities of sewage without offence, although it ought not to be overlooked that since many of our streams are the sources of public water supplies, the effect of sewage pollution may be even more harmful than though effluvia nuisances were produced, which, however unpleasant to the sense of smell, are not always the source of special impairment of health. Again, it may be pointed out that land, even in the immediate vicinity of large towns, is much cheaper here than abroad. In a number of cases in England, the lands utilized for sewage irrigation have cost as much as 2,000 to 3,000 dollars per acre, whereas, with us frequently suitable lands can be purchased within practicable distance of towns for from one-quarter to one-eighth of these figures.

The large amount of experience gained abroad, however, should have weight and value. For this reason we should carefully study the current European practice of sewage utilization and the history of past efforts. We have tried too often to

[Continued on page 9]



IRRIGATING CORN BY SEWAGE AT PLAINFIELD, N. J.

acades, and the consequent increase of pollution of streams from which water supplies are obtained, the subject of sewage disposal has come to be one of prime importance. As regards the United States, however, it is only within the past few years that the subject of sewage purification and its relation to the purity of streams has attracted general attention. In view of the large number of people concerned and the benefits to be derived from the dissemination of information on this subject, there is probably no topic relating to water supply and irrigation which is of greater importance to the country as a whole.

The citizens of all our municipalities are interested as a mere matter of sanitation in the innocuous disposal of sewage. Independent of commercial considerations, the towns should welcome any suggestion looking toward ridding them of what is in most cases a dead weight on the hands of the municipal authorities. The farmers, especially market gardeners in the vicinity of towns, should be able to utilize sewage with advantage to

modify somewhat this popular misapprehension. At the present time the few persons who have thought out the rational view of these subjects hold that the old notion was, like many old notions, essentially wrong. Sewage is a great fact of existence, and the proper way is not to ignore it but to meet the problem on its merits, the same as other difficulties are met and overcome. In this spirit, in England, at any rate, it has become quite common to build the necessary works connected with sewerage and sewage disposal as ornamental as possible, and in the United States this plan has, to a certain extent, been likewise followed.

The growth in England of great manufacturing industries and the consequent pollution of the streams of that country at the beginning of the present century forced the English cities to consider the necessity for sewage purification at an earlier date than elsewhere. Sewage irrigation as a branch of applied science may therefore be said to have originated in England. At the present time a more general use of sewage purifica-

by the cultivator from the utilization of sewage in agriculture.

Let us see what has already been accomplished in this country. As regards rainfall, the United States divides naturally into three regions—the humid, subhumid and arid. The humid region includes all of the country east of the Mississippi River, together with the States of Iowa, Missouri, Arkansas, and Louisiana west of that river. It also includes portions of North Dakota, South Dakota, Nebraska, Kansas, Indian Territory, and Texas. The subhumid region may be taken to include the remainder of North Dakota, South Dakota, Nebraska, Kansas, Indian Territory, and Texas. The arid region embraces Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming, although limited areas in several of these States and Territories may be classed as humid.

In the arid and semiarid portions of the West, sewage utilization is of special importance, for there every drop of water, especially during the summer season, is needed for the produc-



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ISSUED JANUARY 16, 1900.

A full printed copy of drawings and specifications of any Patent in this list will be sent on receipt of 10 cents in postage stamps. Preserve this list for future reference and always send name, title of invention and date of issue.

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Shovel.....P. Nicolay  
Size treating apparatus.....A. Stephan  
Slate mantlepiece.....W. J. Lewis  
Snap catch.....J. W. Brassington  
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Spark arrester.....J. W. Harrelson  
Stacker, straw.....J. A. Mussetter  
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Steam engine.....J. H. Harris  
Steam heater.....J. A. Rathbone  
Stove.....J. A. Unglab  
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Stovepipe fastener.....W. H. Smith  
Straw carrier.....W. E. White  
Surface gage.....W. O. Elliott  
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Suspenders.....A. S. Grimm  
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Switch operating device.....E. J. Stanley  
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Casting mold.....G. P. Bassett, jr  
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Churn.....E. Burk  
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Furnace, fuel feeder for.....W. N. Decker  
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## DISBARMENT OF ATTORNEYS.

The following named attorneys have been disbarred from practice before the U. S. Patent Office.  
J. B. Bowlin, Williamsburg, Ky.  
Thaddeus H. Allen, Natchez, Miss.  
J. W. Hicks, Louisville, Ky.  
Newton Handy, Canton, Miss.  
Frank A. Harrison, Washington, D. C.  
S. J. N. English, Wapakoneta, Ohio.  
Edith English, Wapakoneta, Ohio.  
George Abbot, Hamburg, N. Y.  
Nathan W. Fitzgerald, Washington, D. C.  
Harry S. Kellogg, Sandusky, Ohio.  
John B. Williams, Catlettsburg, Ky.  
Greene F. Anderson, Nashville, Tenn.  
A. A. Tinsley, Lawrenceburg, Ky.  
Alfred E. Glascock and Glascock & Co., Washington, D. C.  
Alfred Meltzer, Chicago, Ill.  
William A. Aultman, Mt. Orab, Ohio.  
Frank H. Kerr, Steubenville, Ohio.

## STARLIGHT IN PHOTOGRAPHY.

Experiments To Test Its Feasibility in Sensitizing Plates.

Experiments are now being made at the Harvard Observatory which, if results are favorable, will have an important bearing on photographic art. These experiments are calculated to test the feasibility of using the light of the stars as a standard of light in photography. It is the practice among manufacturers of photographic supplies to sensitize plates with lamp light of different degrees of brilliancy, with the result that plates of different make have no comparative significance. By substituting starlight for lamplight, an unvarying standard may be had, with great advantage to photographic art, if the substitution should prove feasible.

The test of star light is being made by means of a very simple apparatus. The light being admitted to the dark chamber through a small hole, and then, for the purpose of calculating a secondary standard for general use, by passing the pencil of starlight through a lens which increases its brilliancy a hundred times. By means of this apparatus the relative brightness of the different stars and planets is being ascertained as an incident to the investigation.

## Sewage Irrigation.

(Continued from page 5.)

work out for ourselves what is popularly known as the American method, ignoring the experience of others. We may thus attain unto knowledge in the course of time, but many unprofitable investments will be made and money and time will be unnecessarily lost. In this respect the conditions are similar to those seen in the development of ordinary forms of irrigations in the West, where frequently expensive works have been built and operated without a knowledge of the water supply or other conditions. A very cursory study of Old World irrigation would have saved considerable loss and resulted in more satisfactory results than those now attained. In many of these older countries, having physical and climatic conditions almost identical with our own, methods of agriculture and of controlling and utilizing water have been developed through the trials and failures of unnumbered generations. We are merely repeating many of their mistakes, and are only gradually coming to appreciate the fact that a more complete knowledge of the experience of the rest of mankind would be of incalculable value to us.

In the next number there will be discussed the different questions that arise and a general consideration will be given to the question of stream pollution.

## Rubber Industry Of Sierra Leone.

The kewattia, or rubber tree of West Africa, is one of the most beautiful trees of the forest, growing usually to the height of from 40 to 60 feet. Its leaves are from 4 to 9 inches in length by from 1 to 3 in width, oblong, and tapering toward the ends, supported by a stem from 8 to 9 inches long.

There are also several species of vines which yield a grade of rubber inferior in some respects to that obtained from the tree; however, when gathered with care, this commands a ready sale.

The supply of the Freetown market for the most part comes from the hinterlands of Sierra Leone and from the Foutah country in the French protectorate farther in the interior. That which comes from the Foutah territory is limited, owing to the export tax of 3 cents per pound placed by the French upon all rubber sold by natives outside of their protectorate. Notwithstanding this prohibitory restriction upon the native rubber venders, there are several regular traders who furnish to this market a good quantity of Foutah rubber every season. This rubber is almost invariably adulterated with clay, yet it grades well in the local market and brings a good price.

The dry period from November until May is the gathering season. Native chiefs supervise and control the sale of the output of their respective territories. The method of gathering the sap is very simple. The body of the tree is tapped, and the juice flows until exhausted; later, new incisions are made. The juice is usually caught in cups or calabashes attached to the tree so as to prevent impurities appearing in the rubber. The neglect of this precaution is responsible for a percentage of the incidental adulterations of otherwise good rubber, frequently found in the local market.

The native, in his efforts to increase his stock, frequently bleeds the roots as well as body of the tree; this is fatal to the tree. The product is known as

"root rubber," and, besides containing large quantities of impurities, is very inferior to any grade of tree rubber, and would be refused altogether by the local buyers, in order to discourage the destruction of the forests, were it not for the sharp competition for export trade.

The rubber is brought to market overland by caravans of natives, or most frequently, by canoes. These cargoes are generally consigned to some particular agent, though often they are sold to the one making the best offer. For convenience, rubber is arranged in three classes or grades, known as No. 1, No. 2, and No. 3, the character of the tissue and freedom from impurities being the determining factors, as well as the kinds of adulterations. Considerable ability on the part of the agent is necessary to enable him to properly assort and select the rubber, and to detect adulterations. There are two classes of these—accidental and intentional. The former is the result of carelessness on the part of the gatherers, who do not use proper receptacles for the juice. Intentional adulterations are due to efforts to increase volume and weight by use of dirt, sand, bark, and sometimes stones. Another species of fraud is the mixture of other nonelastic gummy substances with pure juice; still another is to soak rubber by placing it in pits close to the water for a long time. Rubber so treated is seriously injured in quality and at the same time increased in bulk and weight.

There is being inaugurated by the governor and officials a plan to foster the planting of rubber trees and vines in the colony. To this end, they have caused to be issued pamphlets of instructions in regard to seeding, transplanting, etc., through the department of agriculture and horticulture. It is hoped that there will be a decided improvement as to quality and quantity of exports in the near future.—Report of Consul at Sierra Leone to State Department.

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## PATENTS

"HOW TO OBTAIN PATENT, TRADE-MARK AND COPYRIGHT PROTECTION" in the safest and cheapest way is the subject of a copyrighted treatise of mine—I will mail it upon application to anyone likely to be interested.

It contains a most valuable paragraph pertaining to the protection of patent and trademark rights in the new colonial possessions of the United States. Write for it. Advice free. Correspondence solicited, and promptly and carefully answered.

E. G. SIGGERS, Patent Attorney,  
(19 Years Actual Experience.)

918 F St., N. W. WASHINGTON, D. C.

## PATENTS



H. R. 7017.

## A BILL

Amending the statutes relating to patents relieving medical and dental practitioners from unjust burdens imposed by patentees holding patents covering methods and devices for treating human diseases, ailments, and disabilities.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress Assembled.* That section forty-eight hundred and eighty-six of the Revised Statutes be, and the same is hereby, amended by adding thereto the following paragraph:

"But no patent shall be granted upon any art of treating human disease, or ailment, or disability, or upon any device adapted to be used in the treatment of human disease or disability, or attached to the human body and used as a substitute for any lost part thereof, or upon any art of making such device, unless such device, is adapted to be put on the market and sold substantially complete and ready for use or attachment," so that such section shall read as follows:

"Sec. 4886. Any person who has invented or discovered any new and useful art, machine, manufacture, or composition of matter, or any new and useful improvement thereof, not known or used by others in this country before his invention or discovery thereof, and not patented or described in any printed publication in this or any foreign country before his invention or discovery thereof, or more than two years prior to his application, and not in public use or on sale in this country for more than two years prior to his application, unless the same is proved to have been abandoned, may, upon payment of the fees required by law and other due proceeding had, obtain a patent therefor.

"But no patent shall be granted upon any art of treating human disease, or ailment, or disability, or upon any device adapted to be used in the treatment of human disease or disability, or attached to the human body and used as a substitute for any lost part thereof, or upon any art of making such device, unless such device is adapted to be put on the market and sold substantially complete and ready for use or attachment."

Sec. 2. That section forty-nine hundred and twenty-one of the Revised Statutes be, and the same is hereby amended by adding thereto the following paragraph:

"Nor shall any suit or action be maintained for the infringement of any patent for an art of treating human disease, or ailment, or disability, or for any patent for any device adapted to be used in the treatment of human disability, ailment, or disease, or attached to the human body and used as a substitute for a lost part thereof, or an art of making such device, unless it appears that such device can be made and put on the market substantially complete and ready for use or attachment," so that said section shall read as follows:

"Sec. 4921. That the several courts vested with jurisdiction of cases arising

under the patent laws shall have power to grant injunctions, according to the course and principles of courts of equity, to prevent the violation of any right secured by patent, on such terms as the court may deem reasonable; and upon a decree being rendered in any such case for an infringement the complainant shall be entitled to recover, in addition to the profits to be accounted for by the defendant, the damages the complaint has sustained thereby; and the court shall assess the same or cause the same to be assessed under its direction. And the court shall have the same power to increase such damages, in its discretion, as is given to increase the damages found by verdicts in actions in the nature of actions of trespass upon the case.

"But in any suit or action brought for the infringement of any patent there shall be no recovery of profits or damages for any infringement committed more than six years before the filing of the bill of complaint or the issuing of the writ in such suit or action, and this provision shall apply to existing causes of action.

"Nor shall any suit or action be maintained for the infringement of any patent for an art of treating human disease, or ailment, or disability, or for any patent for any device adapted to be used in the treatment of human disability, ailment, or disease, or attached to the human body and used as a substitute for a lost part thereof, or an art of making such device, unless it appears that such device can be made and put on the market substantially complete and ready for use or attachment."

Sec. 3. That this Act shall take effect immediately upon its passage, but the paragraph added to section forty-eight hundred and eighty-six shall not be held to apply to any application for patent filed prior to said date; nor shall the amendment to section forty-nine hundred and twenty-one affect the rights of action that may have accrued prior to the passage hereof.

## Women's Wages.

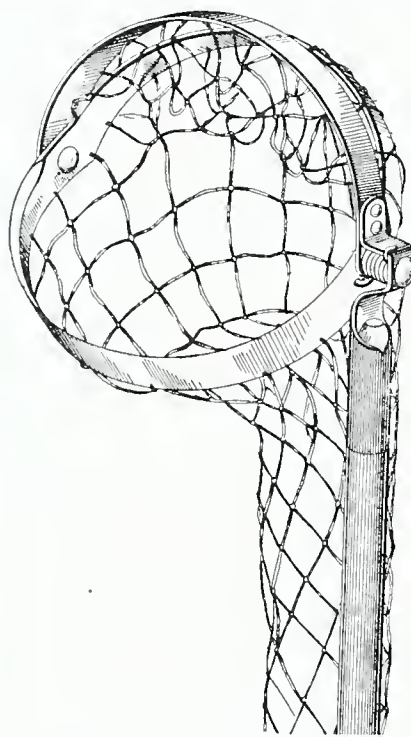
An interesting comparison of men's and women's wages come from a French writer, who says that in the United States a woman will earn about half as much as a man for doing the same work, and in England rather less. In Vienna the average earnings of a woman are from \$1.20 to \$1.60 a week. In Italy she gets about a third as much as a man. In Germany her earnings average \$1.40 a week, while in France she is paid somewhat more than half a man's wages. The writer's belief is that women, on the whole, receive fairer treatment from their employers in France than elsewhere—a belief which may possibly have no more solid foundation than patriotism.

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## RECENT PATENTS.

## O. A. Norlund, Fruit Gatherer.

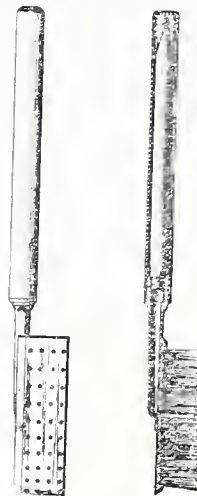
An invention that will be of interest to fruit growers and farmers in general, is the subject of a recent patent issued to Mr. Olof A. Norlund, of Cedar Run, Pa. It is a fruit gatherer by means of which fruit at any height



may be easily picked and transferred to the ground or receptacle without bruising or injuring such fruit. This of itself is sufficient to commend it, but the simplicity of construction will bring it within the reach of everyone, and no farmer will feel that he can get along without it. As shown in the cut it comprises a pair of pivoted cutting jaws attached to the end of a pole. A netting or sleeve is attached to the jaws and runs down to the operator. The operation is obvious. The jaws are placed over the fruit, a pull upon the sleeve closes the same and cuts the stem allowing the fruit to fall down the sleeve to the operator. A coiled spring opens the jaws when the tension upon the sleeve is relieved.

## D. W. Tower, —Brush.

The brush patented by Mr. Daniel W. Tower of Grand Rapids, Mich., is a unique and highly useful novelty that will find especial favor with traveling people. The illustrations of the device clearly show the construction as applied to a tooth brush, although as will be readily understood,

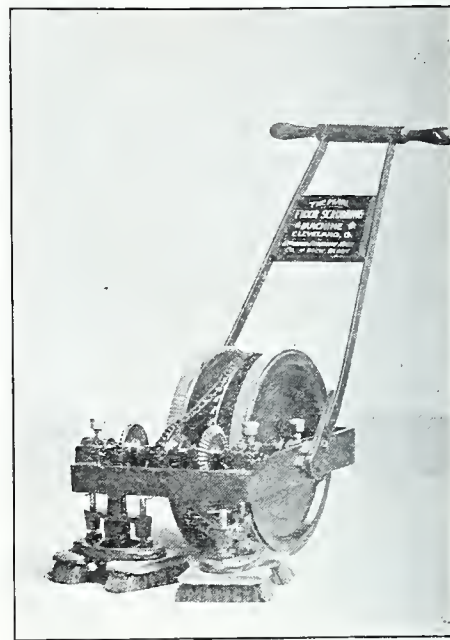


it may be applied with equal advantage to other kinds of brushes. The first view shows the complete device, the second is a sectional view showing the construction of the same. It will be seen that the handle comprises an outer casing within which is housed a collapsible tube. This tube contains

suitable dentifrice which may be forced into the bristles. When not in use the brush head is covered by a perforated casing which slides tightly upon the same. The casing protects the bristles from being soiled or injured, but allows the admission of air and the escape of moisture so that the brush is kept in perfect sanitary condition. It is thus seen that the article is compact and inexpensive and will recommend itself to everyone.

## A New Scrubbing Machine.

The accompanying illustration gives an excellent idea of a floor scrubbing machine recently invented by H. C. Burk and manufactured by the Standard Scrubbing Machine Co. of Cleveland, Ohio. The machine, as shown,



comprises a frame carried upon a pair of rubber tired drive wheels which communicate motion through a central sprocket chain to a horizontal shaft. This shaft has a pair of bevel gear wheels which mesh with similar gear wheels arranged upon the upper ends of two vertical shafts. The lower ends of the vertical shafts carry a plurality of brushes, which are adjustable and are held at the required pressure to the floor by suitable weights. The machine is exceedingly practical and is a decided improvement, as it scrubs the floor thoroughly and works as well close to the base-board of the floor as in any other position. Furthermore it does not splash, and being easily operated is a great time and labor saver. As an evidence of the merit in which it is held it is now being used at the State, War, and Navy Departments in Washington and is giving excellent satisfaction in scrubbing the floors of the great corridors of that building.

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## Agricultural Implements in India.

The population of India is about four times that of the United States, while the latter has about double the area of the former. As the bulk of the people are employed in agricultural pursuits it is obvious that those parts of India capable of cultivation must be divided into small farms. Each man rents, generally, but a few acres. There are, of course occasional large plantations run by a rich man or rajah, but these are exceptional. The ancient plough, costing perhaps 50 or 75 cents, pulled by oxen, is used. Few implements are employed. The Mamooties—a kind of mattock, more like a carpenter's adz, with a wider blade—are universally used for all manner of work in the ground. Natives will not use the wheelbarrow or the shovel. Women carry dirt, mortar, brick, and in fact every thing in baskets on their heads.

On account of the famine of 1896-97 and again this year in Western India, the country people are not able to buy. Besides, there seems to be a disinclination to adopt new methods, making easier the daily burden. A short time since, a large agricultural-implement firm of England sent a steam plow and men to exhibit it in India. They took it all over the country and at a great expense gave practical exhibitions and instructions. I am reliably informed that they did not secure a single order. I cite this as an example of the native indifference to improvements.

Just now, there is considerable talk in local papers on the question of drilling deep wells for water in the famine districts of India. Here is a chance for an American firm to do some business.—Report of Consul Fer to State Department.

### Prosperity In Canada.

Electrical industries in Canada have fully shared in the prosperity now felt throughout the Dominion. According to the Canadian Electrical News, the leading manufacturing and supply companies report that the volume of their business for 1899 exceeded by upwards of 75 per cent the business done during 1898. More than half the output of these companies was applied to the extension and improvement of existing plants, the bulk of the machinery sold being for lighting and power purposes. There was but little new railway-construction work done during the year, but a considerable amount of apparatus was required for extensions and improvements.

Improvement and development have been quite as marked in the commercial as in the mechanical field. The business done has been so large and so profitable that the stock of the two leading manufacturing companies has risen fifty points during the year, and further advances are predicted. The workshops of the electrical manufacturing companies are said to be crowded with orders to such an extent that no promise of delivery at a specified time can be made, and prices are firmly maintained.

The utilization of water power for the generation of electricity has been taken up with energy throughout the Dominion. This new medium of power transmission has made possible the harnessing of Canada's almost endless water powers, and the cheapened production resulting accounts in part for the rapid growth in Canadian manufactures.—From report of Consul Brush to State Department.

The people of the United States consume 4,000,000 bushels of peanuts annually at a cost of about \$10,000,000. The growing of the peanut in this country is gradually increasing, but much of the product consumed is brought from abroad, notably from Spain, Egypt, and Japan. Yet the South Atlantic seaboard and the lower Mississippi Valley, as well as other parts of the United States, have been shown to be abundantly responsive to the cultivation of this ground nut, the average yield being about sixty bushels per acre. The peanut vine is a most excellent article for fattening cattle. Its fatty property is 15 per cent, as compared with 2.11 per cent for clover hay, 1.97 per cent for timothy hay, 4.04 per cent for cowpea hay, and 2.05 for alfalfa.

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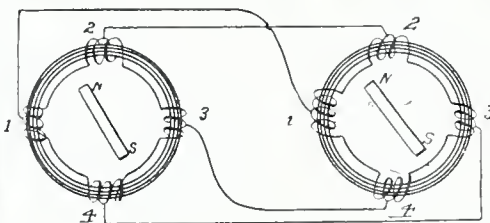
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## AND PATENT INDEX.

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### U. S. PATENT OFFICE.

#### DIVISION VIII.

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Naturally, the division is very old. Almost the first needs of man after he was fed and warmed was for something to sleep on and something to sit on. From these have grown up all the bewildering array of modern furniture. The division was first constituted as that of Household Articles and Furniture, and contained Games and Toys, Umbrellas and Canes and Toilet Articles in addition to what it now includes. Later, these were taken away because their growth and that of the other classes rendered the Division unwieldy, and made it necessary to relieve it.

Although we know that the ancients must have had furniture, the records describing it previous to the fifteenth century are very rare. There are almost no indications as to that possessed by the common people of antiquity. Some cups and other vessels have been found in ancient ruins along with the remains of massive thrones made of heavy castings morticed together. The Bible refers to the luxurious furniture of the Princes of Ninevah, but no examples of it survive to our day. The Phoenicians had simple but massive furniture of bronze. The earliest piece of which we have any detailed description was of the table on which the ark of the tabernacle rested, which, except for its ornamentation, seems to have been

much like a table of today.

The first article brought into existence by necessity was almost certainly the bed. Wicker bedsteads formed of the ribs of palm leaves are sketched in Egyptian paintings. Among Asiatics, divans were used. Among the Japanese today, mats serve for beds, chairs and tables. Next came piles of reeds and rushes enclosed in bags and laid on benches. These prevailed in England until a comparatively late day. The bed of a countess in the fifteenth century consisted of a board laid across two supports and strewn with straw. Cradles for children did not exist until of late years, ba-

tightening them. There is great activity in this line, and there are many varieties of "springs" or fabrics—collapsible, spiral and combinations of the two.

Another line of very recent invention concerns itself with the box couch. Originally this was merely a box for holding clothes with a cloth stretched over it; then it was one with a mattress on top of it, and then it became the elaborate upholstered article it is today. But then a difficulty arose. The lids were too heavy to be lifted easily when the owner wanted to get into the box. So systems of springs were invented whereby this weight was re-

the like were merely planks placed on two trestles. Strange to say, however, a folding chair like a modern campstool, was a familiar article four centuries ago. It is needless to point out the immense progress made in this art. The most striking recent advance in invention has been in the machinery for upholstering chairs and the like, in which hand work is now almost superseded. Some of the latest inventions in this line are exceedingly valuable. Other forms of chairs which did not even exist until comparatively recently are the dental chair, the barber chair and the operating chair or table. These are all very com-

plicated and usually require pages of description to set forth their merits and marvels. The touch of a lever will now alter the head and foot rests, or the body of the chair, tilting it in any desired direction and throwing it into the angles which will most facilitate the work of the operator. Some of the most valuable of these last inventions have been made by doctors and dentists, who knew exactly what was needed and who happened to possess a turn for mechanics which enabled them to carry their ideas into effect. Most of such articles, however, are owned and manufactured by a few big companies.

A curiously up-to-date form of chair is that for the railway car, both day and sleeping. New appliances are constantly being in-



DIVISION VIII. UNITED STATES PATENT OFFICE.

century are very rare. There are almost no indications as to that possessed by the common people of antiquity. Some cups and other vessels have been found in ancient ruins along with the remains of massive thrones made of heavy castings morticed together. The Bible refers to the luxurious furniture of the Princes of Ninevah, but no examples of it survive to our day. The Phoenicians had simple but massive furniture of bronze. The earliest piece of which we have any detailed description was of the table on which the ark of the tabernacle rested, which, except for its ornamentation, seems to have been

bies being simply wrapped in swaddling clothes and laid anywhere. Later cradles were hollowed out of tree trunks so that they could be rocked. It was a far cry from this to the luxurious beds of modern days. Since the Patent Office was constituted, nearly all of the soft couches of the present have been devised, while the first invention of a folding bed is within the memory of those now living. Some of the latest inventions in this line concern themselves with the woven wire fabrics, popularly known as "springs," with the manner of their attachment to the frames, and with the ways of

believed and a touch would throw up the lid. But even then, it was necessary to remove the couch from the wall in order to have room to open it, and accordingly intricate systems of levers were contrived, whereby the top was thrown forward as it rose and the box could stand wide open while the couch itself was tight against the wall. This illustrates the way in which one invention leads to another.

Next to the bed probably came the chair, which for centuries was merely a stool. What we call chairs were reserved, when they existed at all, for people of rank. Benches, sofas and

vented which make sleeping car seats more comfortable and more easily adjusted. Patents for these are usually taken out in the interest of the railway companies, who buy them from the inventors, or get them up themselves to meet wants that have become manifest.

Next, in point of antiquity, probably came the table, and it seems to have sprung into existence almost fully developed, there being little essential difference between the plank placed on two trestles and the ordinary table of today. Extension tables are of course quite modern.

These three articles of furniture—





CHIEF EXAMINER C. ALEXANDER MASON.

beds, chairs, and tables—were about all that existed in the middle ages. Some very rich people also possessed chests and cabinets of curious workmanship. The sixteenth century was the age of tapestry working, when most of the curious examples of the work were executed. In those days, windows were regarded as furniture, and were taken out and stored away as late as Queen Elizabeth's time. Then a house with three beds was considered elaborately furnished. The walls were bare without plaster or hanging and the floors were without carpets. Royalty was not lodged nearly so well as the every day citizen is today. Over all this line of progress Division VIII keeps watch.

Especially would the ancients have wondered at the array of small kitchen and household things which pass through the hands of the examiners. Every sort of device which can lighten the work of the housewife either has come, is coming, or will soon come under their examination. There is lots of money in some of the smallest of these. For instance, a little soap holder has recently brought in immense profits, although it costs only a few cents complete.

Store furniture is a class which shows great recent development. It includes all store fixtures and all devices for showing and for selling goods, including some of the "nickle in the slot" machines, that vend articles of merchandise. The mechanism whereby the coin works these machines goes to another division, but the machine itself must be passed on by this one.

The head of the Division is C. Alexander Mason, who was appointed Fourth Assistant Examiner September 6, 1884, was promoted through the successive grades, and finally appointed Primary Examiner on January 27, 1898, as the result of various competitive examinations. He is a graduate of the National Law School of the District of Columbia. Mr. Mason may be said to have been "born" in the business, as his father was a prominent Patent Attorney, and Mr. Mason naturally inherits his love for mechanical problems.

Mr. Chas. F. Fitts, the ranking assistant of Division VIII, was educated

at Williams College, and the Massachusetts Institute of Technology, and is a member of the bar of the District of Columbia. Mr. Fitts examines the classes of Beds and Chairs.

Mr. Herbert Lewis, Third Assistant Examiner, examines the class of Furniture. Mr. L. D. Underwood examines the class of Curtains, Shades, and Screens, and Dr. L. A. Sadler the classes of Store Furniture, and Kitchen and Table articles.

## IMPORTANT COURT DECISIONS IN PATENT CAUSES.

### COURT OF APPEALS OF THE DISTRICT OF COLUMBIA.

MCBERTY v. COOK. Decided February 13, 1900.

1. INTERFERENCE—BROADENING CLAIMS TO COVER DEVICE OF ANOTHER APPLICANT—ESTOPPEL.

Where in an interference between an application filed March 22, 1897, for the reissue of McBerty's patent dated August 13, 1895, and an application of Cook filed July 29, 1896, it was contended that Cook's original application contained no claim to the invention of the issue, that not until five months thereafter and after the rejection of his claims in part did he amend by setting up the claims of the McBerty patent now in interference, and that consequently he is estopped, under *Beckman v. Wood*, 89 O. G., 2459, 2462, from claiming priority of invention as against McBerty's subsequent application for reissue, *Held* that the attitude of the parties is different from that shown in *Beckman v. Wood*. McBerty did not come into the office originally after Cook, but before, and when he made his reissue application Cook's later claims had been made. He does not therefore stand in the situation of one who claims a specific invention with specification and claims that are not embraced in the original application of an earlier applicant, but which the latter seeks by subsequent amendment to dominate with claims that have no foundation in the original description of his invention.

2. SAME—SAME—SAME.

*Held*, further, that the amended claims of Cook are clearly shown and described in the specification of his original application and that his amendment constitutes no departure which would subordinate him to the claims of even an intervening applicant, as was the case in *Beckman v. Wood*.

3. SAME—DELAY IN APPLYING FOR PATENT.

Where Cook reduced his invention to practice in 1891 and 1892, but did not put it into commercial use or apply for a patent until 1896, *Held* that the delay of Cook in applying for a patent or making commercial use of his invention was not such as to indicate an intention to suppress or conceal his invention from the public that would subordinate his right to that of McBerty, who promptly applied for and obtained a patent.

4. SAME—SAME.

Delay is often a potent circumstance in aid of the determination, in a case not otherwise clear, of the question whether an invention has been successfully reduced to practice or has re-

sulted in nothing more than an abandoned experiment (*Esty v. Newton*, 86 O. G., 799, cited.)

5. SAME—EQUIVALENT DEVICES.

A device embodying two springs used to disrupt a telephone-circuit is substantially equivalent to a device embodying one spring for the same purpose.

FAY v. DUELL, COMMISSIONER OF PATENTS. Decided December 6, 1899.

1. SECOND APPLICATION AFTER ADJUDICATION OF THE FIRST APPLICATION—RES ADJUDICATA.

Where an application for patent was rejected by each tribunal of the Patent Office and the applicant filed a new application without substantial change *Held* that the subordinate tribunals were right in declaring the question of patentability *res adjudicata*. (*Barret v. Duell, Commissioner of Patents*, 87 O. G., 1075, cited.)

2. SAME—SAME.

While a liberal right of filing a new application in place of one rejected has been recognized by the Supreme Court in the case where the Commissioner of Patents has reconsidered his former grounds of rejection and issued a patent, yet it does not follow that the doctrine of *res adjudicata* may not be applied to such new application in the discretion of the Commissioner. It is as much to the public interest that there should be an end of litigation in the tribunals of the Patent Office as in others.

3. PATENTABILITY—NOVELTY—GARMENTS

A novelty involving a state of art so universal and common as the making and adjustment of clothing must be of a radical character to overcome the presumption against its patentability. (*Dalby v. Lynes*, 71 O. G., 1317. *Way v. McClarin*, 96 Fed. Rep. 416, cited.)

4. SAME—PRESUMPTION AGAINST PATENTABILITY—FORCE OF PATENT OFFICE DECISIONS.

The presumption against the patentability of any claim is made very strong by the concurrent denial of all the tribunals of the Patent Office to whom in turn it has been presented. (*Smith v. Duell, Commissioner of Patents*, 87 O. G., 893, cited.)

### DECISIONS OF THE COMMISSIONER OF PATENTS.

EX PARTE BANCROFT AND THORNE. Decided January 15, 1900.

1. DIVISION—GRINDING-MACHINE AND ATTACHMENT.

Division should not be required between a claim to a combination of elements in a grinding-machine and a claim for an attachment to be used in that machine for grinding curved surfaces, when it does not appear that such attachments have acquired a distinct status in art and manufacture, and are separately classified in this Office.

2. SAME — SAME — SUBCOMBINATION CLAIMS.

Where an attachment when in place forms with the other elements a complete organized machine, all of the parts of which cooperate to grind curved surfaces, *Held* that the combination of parts forming that attachment constitutes a subcombination in that organized machine and that a claim to it may properly be retained in the same case with claims to other combinations of elements.

EX PARTE WICKERT. Decided December 22, 1899.

LABEL—USE OR PUBLICATION PRIOR TO APPLICATION—ADDING INCONSPICUOUS WORD—REGISTRATION REFUSED.

After a label producing a certain artistic effect has become non-registrable because of the use or publication before application for registration was filed, it cannot be rendered registrable by adding thereto an inconspicuous word which involves nothing more than the work of a type-setter and which does not change in any material respect the appearance of the label.

## H. R. 887.

### A BILL

To provide for aiding and completing specimens and productions, both natural and manufactured, of the United States and of foreign countries, to be exhibited in the Philadelphia Museum for the purpose of increasing the trade of the United States.

Whereas there has lately been successfully held in the city of Philadelphia the first National Export Exposition occurring in the United States; and Whereas it is expedient that the collection of the productions and the manufactured goods of the United States and other countries now in charge of said Museums should be made full and complete, in order that the greatest national benefit in respect of foreign trade may be effected; Therefore,

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That the sum of two hundred thousand dollars be, and is hereby, appropriated, out of the money in the Treasury not otherwise appropriated, to the Philadelphia Museums, for the purpose of completing the collection from foreign markets of samples of merchandise of the character in favor and demand therein, and of illustrating the manner in which merchandise for such markets should be prepared and packed, together with necessary business data concerning said samples and trade conditions abroad as will be of the most benefit to American manufacturers, merchants, and producers, and to aid and assist them in extending their trade with and in opening new markets in foreign countries: *Provided*, That the material so collected, together with all data that the bureau of information of the Philadelphia Museum may obtain from its various foreign agents and from other sources, shall be distributed free to boards of trade, chambers of commerce, and other trades organizations throughout the United States, for the information of the American people in respect of the subject.

The objects so collected shall be deposited with and in charge of the said Philadelphia Museum, subject to free exhibition therein under proper rules and regulations for their safe-keeping.

The Mexican government has issued an order that railways must adopt a uniform coupler for freight cars. Other measures to prevent accidents to train hands have been taken.



## RECENTLY PATENTED INVENTIONS AND DESIGNS

Procured through the Patent  
Soliciting Department of E. G. SIGGERS.  
Washington, D. C.

Madison and John Bowman, Toledo, Ill. Threshing Machine.—This is a very simple construction and arrangement whereby small seeds, such as timothy and clover may be cleansed in the machine and made ready for market without subsequent treatment. The machine obviates many defects in the ordinary machine enabling the seed to be cleaned from the chaff in its travel from the conveyor to the chaffer. The construction may be applied to any thresher with very little trouble or expense.

Calvin Chamberlain, Foxcroft, Me. Paddle Wheel for Boats.—The invention is particularly intended for boats operating in shallow water, although it may be used with equal advantage in deep water. The wheel is made up of a plurality of spaced disks, upon the facings of which are arranged an annular series of V-shaped blades which are disposed in staggered relation to one another, thus giving a great impact upon the water. Any number of disks may be used in proportion to the size of the vessel.

William F. Cochran, Osborne, Kan. Harrow.—This is an improvement on his former patent and besides providing a cheaper and more efficient construction, the arrangement is such that the strain upon the harrow-sections is lessened and the draft more evenly distributed. The harrow is carried by a wheeled frame and is made in three toothed sections, the two outside having efficient means for raising them to a vertical position when so desired. The whole is a complete practical device that will fill a long felt want.

George Diaz, City of Mexico, Mexico. Grinding Machine.—A grinding wheel is carried upon a shaft to which is fastened a driving member. The whole is mounted on a frame that is adapted to be arranged on a turning lathe or similar machine. By moving the frame so that the driving wheel is brought into contact with the drive wheel of the machine the emery wheel is rapidly rotated. This device is of great benefit in a machine shop, and being simple and of but few parts, is inexpensive.

Oliver Ditsworth, Lanark, Ill. Stock Waterer.—A casing within which is arranged a float that has a valve attached thereto, is placed on the inside of a tank or reservoir. A pipe leads from the casing to a drinking trough. As the water falls in the trough, the float in the casing falls proportionately, thereby opening the valve and allowing the water to enter until the proper level is restored. Thus a practical and useful stock waterer is constructed which keeps a constant supply of water in the drinking trough.

Virgil L. Glaze, Walnut Grove, W. Va. Bicycle Brake.—The brake contemplated in this invention is designed to overcome the injurious effects that the ordinary brake has on the pneumatic tire. This device consists substantially of a friction wheel, made fast to the crank axle, and a spring band partly encircles this friction wheel and has one end fastened to the frame while the other end is bent to form a foot lever. It is only necessary to press upon the lever with the foot to apply the brake. This is a simple device, but it is very efficient.

Homer E. Holmes, Burr Oak, Kan. Door Lock.—A wedge-shaped shank is provided with spurs which engage the

door jamb adjacent to the movable edge of a door. An adjustable shoulder is slidably mounted upon the shank and is adapted to engage the door when it is closed and securely lock it. The present invention presents many advantages, and because of its simplicity and usefulness is bound to find great favor.

Judson W. Ingalsbe, Onaga, Kan. Drum Adjustment.—By means of a new and simple construction, the two heads of a drum may be tightened separately to secure the desired tension on the batter head independently of the adjustment of the snare head, and the arrangement also allows the two heads to be strained at the same operation after they have been separately adjusted; thus allowing the slack to be taken up without disturbing the tension of the two heads.

Samuel M. Neely, Chester, S. C. Cotton Seed Crusher and Distributer. A pair of crushing rolls are arranged below the adjustable feed slot of the seed box. Suitable mechanism is provided to feed the seed to the rolls, and the whole machine is mounted upon a very simple plow and covering device, making an efficient machine that can easily be used as a planter or fertilizer distributor.

Reuben C. Patteson, Summit, Ga. Dinner Bucket.—The bucket has a rounded bottom and vertical partitions which terminate short of the top edge and form a rest for knives, forks, etc. The cover is provided with a ventilator, thus allowing free circulation of air. The invention has many advantages, among which may be stated the manner of keeping the different articles of food separated, whereby they may be easily reached and the ventilation keeps the food in a wholesome condition.

Walter W. Richardson, Pomeroy, Washington. Straw Stacker.—The stacker in this case is entirely independent of the threshing machine, but can be readily attached to and disconnected from one. It is provided with novel means for elevating the straw which is closely bunched by the elevator, before it is deposited on the stack. The machine is simple and efficient and obviates many defects so common to the ordinary stacker.

William R. Wallace, Mount Vernon, Ill. Drill.—This machine is especially intended for coal drilling, and it consists of a novel feed mechanism by which the boring tool is fed forward under normal conditions of work, but which rotates idly with the boring tool when the latter encounters a sulphur strata or "band." Thus the tool is held always to the work, and the arrangement also allows the boring auger to rotate so that it will clean out the cuttings from the hole made by the tool.

Carlton F. Warner, Ticonderoga, N. Y. Screen.—The invention relates to window screens. The frame is made of sheet metal which is crimped over the netting to hold it securely in place. The screen is held in the window by metallic guiding strips fastened to the window frame. The construction makes a cheap substantial screen that is easily operated, and is especially well adapted to fire-proof buildings.

Eugene A. Whorley, Roanoke, Va. Tether.—On the top of a post is pivoted a horizontal bar which carries a series of pulleys. The tethering rope passes over the pulleys and is provided with a weight which also carries a series of pulleys. By this means an animal can graze around the post without the tethering rope becoming entangled in its legs or wound around the post. By varying the number of runs around the pulleys the length of

rope is varied as desired. It is an inexpensive and exceedingly practical device.

John H. Zimmerman, Hardpan, Pa. Level.—This improved leveling instrument comprises a stock having an opening within which are pivoted index fingers. Adjusting screws are arranged at each corner and have graduated scales marked thereon to show the exact amount of adjustment. The simplicity and efficiency of the device will commend itself.

Edward H. Barton, Sturgis, Mich. Pump Rod Connection.—This invention relates to means for connecting a pump rod with either an ordinary handle or a windmill or similar motor. It consists in a coupling rod swiveled to the top of the pump rod, and provided with projections which when turned in one direction engage the handle operating mechanism and disengage the windmill rod, or when turned in the opposite direction engage in the reverse manner. It is a simple device by means of which the connection may be instantly changed.

James O. Bechdolt, Collett, Ind. Hog Ring.—An improved ring to be placed in the nose of a hog to prevent rooting is the result of this invention. It is very simple, preferably being formed of a single piece of wire coiled at the ends into two rings which engage in the snout and having a connecting arm which is provided with a loop. This loop presses upon the main nerve in the snout when the animal attempts to root and the pain caused thereby will make him desist. At the same time the device will not wear or cut the snout, nor catch in sticks or other objects.

Frank O. Bible, Chieppwa Falls, Wisc. Vegetable Thinner.—The device is intended to thin out garden vegetables which are planted in rows. It consists of a rotary chopper having a plurality of knives and operated by a gear wheel. The device is especially designed as an attachment to hand seeders, and is a thoroughly practical and reliable machine that will become a necessity to every farmer.

Orlando J. Cole, Arlington, Ky. Churn Dasher.—This is a rotary dasher consisting of two arms carried upon the rotary shaft. Each arm consists of two blocks which are inclined in opposite directions. Thus when the dasher is rotated the inner blades deflect the contents of the churn downwardly while the outer blades deflect it upwardly. This agitation causes a rapid separation of the butter globules from the milk. To prevent the contents from revolving with the dasher, a pair of breakers of new and improved construction are arranged in the churn, making the whole device very effective.

Joseph Cressman, Washington, N. J. Bicycle Gear.—The invention is a distinct departure in the art, and besides the new driving mechanism provides means for changing from a high to a low gear or vice versa. It comprises geared tracks close to the rim of the wheel and driving mechanism meshing therewith. Two sets of gear wheels, one of high and the other of low speed are connected with the pedal shaft and are so arranged that either may be thrown into gear. The invention is unique and being practical will come into general use.

Bruce Cunningham, Liberty, Ore. Fruit Dryer.—This patent relates more particularly to the means for lifting the stack of trays in the "tower" machine from the bottom tray so that the latter may be removed. The engaging dogs are positive and automatic in this action, and are adapted when the lifting bars are raised, to clear the lower-

most tray and lift the stack therefrom. The device is simple and reliable and is finding great favor.

William J. Fay, Colegrove, California. Wheel Wrench.—A pair of jaws are mounted on a screw-threaded rod arranged to engage the inner side of the hub, and at the same time means are provided for engaging the axle nut. It is then only necessary to turn the wheel and the nut will be unscrewed, and held in proper position for putting on again. The device is double so that either side may be used with equal advantage, and being inexpensive is a very useful instrument.

John W. Linam and Thomas J. Whitworth, Laneport, Texas. Planter Attachment.—This invention relates to an improved planter that can be attached to an ordinary sulky plow or cultivator whereby the operator is enabled to ride, making it especially useful in certain parts of the South where the soil is heavy and sticky and laborious for the attendant to walk in. The machine comprises new mechanism throughout which makes it efficient and reliable in operation.

Sidney L. Long, Magnolia, Minn. Combined Paper Clip and Pencil Holder.—The invention consists of a paper clip and pencil holder bent from a single piece of sheet metal, one edge of which is folded backwardly and then bent into a curved member to form a paper clip, while the other blank is curved upwardly and forms a pencil or pen holder. By this means an effective clamp is constructed that will hold loose leaves of paper and also hold the pencil or pen within convenient reach.

William Luke, San Antonio, Texas. Lifting Jack.—A vertical lifting bar is provided on one of its edges with a rack in which meshes a segmental geared head that is provided with an operating handle. A ratchet lever is attached to the handle and operates to hold the lifting bar at the desired height. This is an inexpensive device that comes within the reach of everyone and will be used extensively.

Milford D. Rider, Pittsfield, Mass. Delivery Attachment for Envelope Machines.—The present invention provides improved means associated with the bed plunger of the machine which delivers the envelope therefrom as it leaves the folding box. The mechanism is simple and efficient and frees the envelope from the bed plunger and delivers it into the receiving box, which is provided with novel means for advancing the completed envelopes. By use of the attachment, the output of the machine is greatly increased.

John H. Zinn, Gettysburg, Penn. Combined Cultivator and Planter.—This is a combination machine of a very great range of usefulness. It may be used as a cultivator or planter or both. It is arranged so that the several parts and combinations may be adjusted for any sort of work over any kind of ground and the device is a great improvement in the art.

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# *Inventive Age*

## AND PATENT INDEX.

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### Report Of Patent Commissioner.

The report of Patent Commissioner Chas. H. Duell, for 1899, is a most interesting document, and shows that the Patent Office has shared in the general prosperity of the country.

A total of 25,527 patents were issued during the year. This includes designs and reissues, and has been exceeded but once, in 1890, when 26,292 patents were issued. There were 1,649 trade-marks, 511 labels and 100 prints registered during the year, and 19,135 patents expired.

Connecticut received more patents in proportion to its population than any other state, the figures being one for every 945 persons, the District of Columbia coming next with one for every 1,154, and South Carolina ending the list with one for every 25,024. In actual numbers, New York is ahead, having received 3,798. Pennsylvania is next with 2,355, and Illinois with 2,152. Alaskan residents have only 1, closely followed by Hawaii with 7, Nevada with 11, and New Mexico with 15. The South is very far behind the North and West, owing to having so many illiterate negroes.

Of the foreign countries England seems to have most faith in American patents, 1,072 having been granted to her subjects. Germany comes next with 888, and Canada with 371. One patent was granted to a Chinaman and three to Japanese. France lags behind with 292 and Russia with 25.

The most interesting part of the report deals with the speed of the Office in dealing with applications. Owing to Mr. Duell's energy, the work of the office has been kept well in hand during the year, and at the date of the report thirty-three divisions were examining applications filed within one month, and three divisions applications filed within two months. It results that in two or three of the divisions, it is possible to get a patent through in as brief a time as seven weeks, a condition of affairs that has never before been equalled in the Patent Office, for under nearly every other administration the divisions have been from one to eighteen months behind in their work. A

revision of the methods and general improvement of the system was begun by Commissioner Duell, and has been carried to a successful termination by the establishment of a system which keeps the work well up to date.

The report deals largely with the work of the classification division and sets forth at length the system adopted. The magnitude of the work of examination and the necessity for a thorough classification is evidenced by the fact that the field of search is yearly increasing, and that at the present time 700,000 United States patents and 1,250,000 foreign patents have been issued, while there are 74,000 volumes of scientific works in the Patent Office library. The object of classification is to reduce the immense mass of matter to classes and subclasses of convenient size, capable of clear separation and definition, and based upon a system sufficiently elastic to provide for future growth.

### The Resignation Of Assistant Commissioner Greeley.

We join the entire patent bar in expressing profound regret at the retirement of Mr. Arthur P. Greeley from the office of Assistant Commissioner of Patents. His resignation has come as a surprise to many who greatly deplore the loss, both to the public service, and to the interests of inventors at large. Standing at the head of his predecessors in office, Mr. Greeley undoubtedly enjoys the distinction of being by far the most efficient and universally endorsed Assistant Commissioner of Patents that has held the office in recent years.

The office of Assistant Commissioner of Patents is one fraught with a multitude of duties requiring the most technical and skillful attention, and the treatment of issues that are of great importance to the interests of inventors. All these have been handled by Mr. Greeley with rare ability and tact, and in a manner that has met the general approval of attorneys practicing before the Office. Seldom, indeed, do we find one holding a quasi-judicial position who has administered his office subject to such a general absence of criticism, and to such full endorsement, as Mr. Greeley has been accorded in the execution of his duties.

Mr. Greeley's success as Assistant Commissioner of Patents, is due to his pleasing personality, and to his thorough equipment for the work. In the hearing of cases, an attorney was always given the most respectful and considerate attention, and the decisions of Mr. Greeley were marked by thorough mastery of the subject, as well as by an equitable and sound application of the law. His versatility with all branches of the law well fitted him for the place, and his thorough legal training, and general technical knowledge, won for him early recognition in the Patent Office. From the grade of assistant in the Examining Corps, Mr. Greeley soon reached the position of a Principal Examiner, and after serving several years in this capacity, received an appointment as a judge of the Appeal Board in the Patent Office, and later as Assistant Commissioner of Patents.

Mr. Greeley's successful career has been watched with interest by the en-

tire bar, and it has become the expressed wish to see him at some time at the head of the Patent Office as Commissioner of Patents, which office he was peculiarly well fitted to occupy. While we deplore the real loss occasioned by his resignation, at the same time we join in the general wish of the profession and his many friends, that his entrance into the field as a practicing attorney will be marked by every encouragement, and crowned with the success he deserves.

### Manufacture of Alcohol from Acetylene.

There has been a great deal of discussion lately as to whether alcohol can be produced from acetylene at a cost that will enable it to compete with the present alcohol industry. In response to inquiries in this line, the State Department sent instructions to certain consular officers in Europe, directing them to report on the manufacture of alcohol from acetylene.

These reports all show that it is indeed true that alcohol can be produced from acetylene. To do it, acetylene, through the addition of hydrogen, has to be changed into ethylene. Then the ethylene is absorbed by concentrated sulphuric acid, and the result will be ethylsulphuric acid. When water is then added, the result will produce sulphuric acid and ethyl alcohol. The latter may be procured by distillation. An interesting experiment is to place some powdered calcium carbide in a bottle, and then add spirits containing more than 10 per cent of water. The latter solution should weigh four times as much as the powdered calcium carbide. In other words, the proportion in regard to weight is 75 per cent spirits containing more than 10 per cent water and 25 per cent powdered calcium carbide. The intense development of gas will soon cease, after which the bottle should be shaken every two or three hours for the following half day. Let the bottle stand quiet for the next twelve hours, after which the liquid can be distilled, proving to be a 100 per cent alcohol free from any water.

Up to the present time the art has not passed the experimental stage and all experiments so far have shown that, while alcohol may be produced by this method, the process is so costly and the yield of alcohol so meager that its cost is about ten times that of alcohol produced in the ordinary way, and that therefore the alcohol industry need not anticipate any opposition so far as the manufacture of alcohol from acetylene is concerned.

### The Phosphate Industry.

The report of the Tennessee Mine Inspector, just issued, shows great development in the phosphate industry in that State. There are at present several hundred valuable phosphate mines in operation, giving employment to 15,000 or 20,000 men, and additional mines are being opened daily. The phosphate rock is now being mined in almost every section of Middle Tennessee and is being very generally used in the South for the manufacture of fertilizers. Recently the sales of phosphate land have been very heavy, one tract having been acquired by a Chicago manufacturing firm for \$100,000 cash. This industry has had its principal growth within the past year.

### Chemical Engineering.

A growing profession is that of engineering chemistry, or chemical engineering. The production on a commercial scale of new chemicals and the manufacture of old substances by new processes, with the improvement of old processes, more and more occupy the attention of capitalists. In Germany much money is made by manufacturing proprietary drugs. Single firms employ hundreds of chemists as pioneers in the discovery of dyes, medicines, etc., that will give monopolies. The manufacture of drugs of this kind is bound to find development in the United States where much chemical talent is unemployed. There is no reason why chemical engineering should not give our drug business a large expansion.

The March number of the Automobile magazine, published by the U. S. Industrial Publishing Company of New York, opens with a spirited frontispiece portrait of Count Bozon de Perigord speeding over a snow-covered track. The leading article is Waldon Fawcett's contribution on "The Street Car of the Future," with illustrations showing all the various forms of motor omnibuses and stage-coaches now in use in this country and abroad. Mr. Fawcett predicts that the automobile will ultimately supplant every other form of conveyance on those routes to which a majority of the travelers who traverse them are attracted by the scenic possibilities. This is attested, he thinks, by the great demand for automobiles which has sprung up at all the leading summer resorts and by the project of American capitalists to establish an automobile line across the Island of Porto Rico, as well as numerous other similar propositions.

A timely article is that on automobile tariffs, summarizing all the rates, customs and regulations concerning automobiles which have come to be established by the governments of the various countries now embraced in the Postal Union. As heretofore the magazine is strongest in its technical department. Among the most interesting contributions to this department are Prof. Michott's able treatise on "Electric Accumulators," Falconet's monograph on "Automobile Tires," Sturme's paper on "Power Increasing Motors," and Prof. Forestier's continuation of his careful work on "Mechanical Propulsion and Traction."

The magazine is unusually well supplied with book notices and press reviews, besides which there is that valuable feature the "Automobile Index," furnishing a complete monthly summary of everything published on the subject of automobilism.

There is a sort of grim humor in the idea of the exclusion of automobiles from cemeteries, as instanced in the recent action of the trustees of the Forest Hill Cemetery at Boston. As the Boston Herald remarked on the matter, "It is but fair to say that the automobiles are not headed that way." It was the senior James Fiske, we believe, who declined to subscribe toward a fence about the village cemetery, saying that there was no use for a fence; those who were inside could not get out, and nobody who was outside wanted to get in!—Automobile Magazine.



## SEWAGE IRRIGATION

## PART II.

## Pollution of Streams. Manufacturing Wastes. Pollution of the Great Lakes.

BY B. G. FOSTER.

In the last number a general outline of the history of the subject was given, together with the distribution of plants in the United States. In this number the question of stream pollution will be briefly considered.

Before proceeding to the main discussion, it is necessary to know the meaning of the terms in common use. By *sewerage* is meant the systematic draining by sewers of the liquid and solid wastes of the human economy, as well as the washings of streets and manufacturing wastes by water carriage. A *sewer* is the conduit through which by the medium of water, such removal is effected. *Sewage* is the generic term, not only for the combined water and waste matter flowing in sewers, but also for the mixed solid and liquid refuse handled either by pail or by pneumatic systems.

Ordinary city sewage contains a great variety of ingredients in addition to the waste water from kitchens, baths, laundries, and other domestic offices. In manufacturing districts it may contain the refuse substances of various manufacturing processes, the whole diluted with a considerable amount of water, to which, in rainy weather, in towns with combined sewerage systems, is added a large amount of sand, earth and organic matter washed from the streets. This ordinarily flows through the sewers and empties into the nearest stream or body of water.

The following is an exceedingly marked illustration of the case in point and will be found in the report of the Passaic Valley Sewerage Commission of New Jersey issued February 1897.

At its head waters, among the hills of Somerset County, New Jersey, the Passaic River is a pure, clear running stream. The same is true of its principal upper tributaries, the Rockaway and Pompton rivers; and while there is some manufacturing in the upper

the extent of the pollution below Paterson that fish life, except a few hardy kinds, has entirely disappeared. The sewage-laden mud shores give out foul odors. Steam users report that the acids of the sewage-laden water have so affected their boilers as to make its use inadvisable. Formerly thousands frequented the river for pleasure purposes, but this is no longer a practice.

Now it is a well established principle of law that every riparian proprietor is entitled to have a stream of water flow by his realty as it is wont to flow by nature. From this principle is derived the old and well settled doctrine that to pollute a public stream is to maintain a public nuisance. The necessities and conditions of modern society have, however, tended to some modification of this principle as thus strictly announced, so that at the present time there are certain reasonable pollutions of streams, or, rather, there are certain specific cases in which a stream may be polluted to some extent without abrogating the essential force of the fundamental proposition. At the same time it must be remembered that the broad proposition that streams ought not to be polluted is on the whole sound. Admitting such premise, we are forced to the conclusion that some form of sewage purification is necessary wherever an aggregation of human beings in thickly settled communities leads to the production of any considerable amount of sewage.

In manufacturing towns the waste from the various processes becomes one of the most serious elements to contend with. In the Tenth Annual Report of the Connecticut State Board of Health (1888) Prof. S. W. Williston, of Yale University, has given an excellent account of these wastes. Professor Williston takes up in his report the waste due to various manufacturing processes, such as brass and iron working, paper making, woolen, cotton and silk mills, etc., and gives under each head the chief sources of pollution.

As a short summary it may be stated that brass works are productive of little sanitary injury to a stream, although their chief waste, sulphate of copper, is the most poisonous to fish of any of the manufacturing wastes. In many of these establishments considerable quantities of cyanide of potash and ammonia are used.

Cyanide of potash is a virulent poison and Prof. Williston states that a

both organic and inorganic, the bleaching wastes, consisting of chloride of lime being especially injurious to fish.

The woolen mills furnish another example, and may be considered one of the most objectionable. Raw wool of ordinary grade contains a third or more of organic matter while fine wool may contain as much as 50 or 60 per cent. This is removed by washing and is generally passed directly into the streams. A large amount of dye waste is also furnished by the woolen mills and forms another serious element. There is also great waste in cotton and silk manufactories and in other arts, but it is thought those mentioned will suffice.



SEWAGE-FARM WHEAT STACKS, LEAMINGTON, ENGLAND.

In England the pollution of streams from manufacturing wastes became very serious many years ago, and as a result of careful consideration of this special phase of stream pollution, a number of sewage disposal plants have been devised, especially with reference to purifying the sewage of each manufacturing establishment at the mill. A large amount of information in regard to such plants with detailed plans, may be found in the fourth report of the Rivers Pollution Commission. It should also be remembered that manufacturers do not throw away chemicals merely for pleasure. Chemicals cost money and therefore when possible they are used over and over again until their strength is nearly spent. In this country many of the large establishments have devised means for recovering the chemicals and valuable products which have heretofore been lost. A number of the large iron mills have appliances for saving the sulphate of iron: as, for instance, the Cleveland Rolling Mill, at Cleveland, Ohio, the Ferric Chemical and Color Works, and the Washburn & Moen Wire Works, at Worcester, Massachusetts. A large proportion of the crude sulphate of iron of commerce consumed in the United States is produced at these several works.

In the woolen manufactories the following examples cited by Mr. Clark, in his report to the Massachusetts Drainage Commission are interesting. At the Loraine Mills, Saylesville, Rhode Island, a method of wool scouring is practised by which the grease is recovered and most of the dirt is eliminated from the wash water before it is permitted to escape. The results at this mill indicate the recovery of about a ton of grease from each 18,000 pounds of wool washed. The cost of the plant for accomplishing this, not including buildings, was \$2,500. The process is considered remunerative. At the woolen mills of Robert Bleakie & Company, Hyde Park, Massachusetts, about 3,000 pounds of wool are scoured daily, the refuse from which, together with sewage and dyeing wastes, flows into a settling basin, whence the effluent passes into the stream. The settling basin consists of a cemented structure

80 feet long, 10 feet wide, and 3.5 feet deep; it is cleaned at intervals and the sludge is used for fertilizer, yielding for this purpose an estimated value of several hundred dollars a year.

It has been clearly shown that when organic matter in increasing quantities is continually poured into a body of fresh water, a point is quickly reached beyond which the body of water has no power of assimilation. When that point is reached, something should be done. For instance, in the area contiguous to the Great Lakes, the necessity is especially apparent. Bordering on Lakes Ontario, Erie, and Michigan are great and rapidly growing cities from which all of the sewage

now passes into these lakes. The surrounding regions are usually not greatly elevated above the lakes, and hence do not afford any opportunity for obtaining upland waters for municipal supplies. The water supplies of towns on the Great Lakes are not only now almost universally taken from these bodies of water, but must necessarily continue to be so taken in the future. At present the sewage of the Great Lake cities is discharged without treatment into the same bodies of water from which the public water supplies are taken. Without going into details for all the Great Lakes, it may be stated that Lake Michigan alone receives at the present time the sewage of municipalities and small towns aggregating over 2,000,000 people, and this is rapidly increasing, having about doubled in ten years.

At Chicago this barbarous practice resulted so disastrously as to lead to the construction of the great drainage canal at a cost of \$33,000,000 by which the greater part of the Chicago sewage is delivered into the Mississippi river. This relieves Chicago, but at the same time, St. Louis and other cities and towns which obtain water from the Illinois and Mississippi rivers, are in a great state of apprehension as to what the result will be upon their water supply.

All this goes to show that some remedy must be had for this constantly growing evil, for although it is well known that streams exert considerable self purifying power, providing they are given time enough, it is evident that where enormous quantities of sewage are being poured into the same, there is no chance of this power being exerted. It was this condition that led to experiments in chemical treatment and land processes and it is to be said that the latter have fully held their own.

To be Continued.

Uncle Sam pays \$3,500,000 a year for the rent of 500 postal cars, which could be built for \$2,000,000, and they would last for twenty years. Uncle Sam also paid one cent a pound for each fifty-six miles of distance that the railroads hauled the mails. This is about fifty times as much as is charged for carrying merchandise — Phil. Record.



TURNIPS AND SWEET CORN, BROCKTON, MASS., FILTRATION FIELDS.

valleys, the river continues bright and inviting until it reaches Little Falls, at which place it receives the drainage from several residences and factories. After passing Paterson, three or four miles below Little Falls, its character completely changes, and from that point to Newark Bay, as stated by the Passaic commission, "its pollution is enormous, constant, and increasing yearly." About 436,000 persons now inhabit the district drained by the lower river, furnishing fully 70,000,000 gallons of sewage a day. So great is

sufficient quantity is annually employed in the Naugatuck Valley, in Connecticut, to destroy all the inhabitants of the United States. Most of it, however, is neutralized by the other chemicals used, so that it is doubtful whether its contaminating influence is very great.

In iron manufacture the waste is chiefly sulphate of iron, which at many works is allowed to pass directly into streams.

In paper manufacture there is always a large amount of waste matter



# PATENTS

ISSUED FEBRUARY 13, 1900.

A full printed copy of drawing and specification of any patent in this list will be sent on receipt of 10 cents in postage stamps. Preserve this list for future reference and always send name, title of invention and date of issue.

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Washington, D. C.

Acetone. Preparing haloid derivatives of..... L. Lederer  
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Cooking utensil lid.....J. H. Swift  
Corkscrew.....J. Blundell  
Corset.....G. Marple  
Corset. Apparel.....M. W. Lawrence  
Cotton openers. Dust trunk or tube for.....W. Frost  
Crate. Folding.....T. A. Killman  
Crate. Knockdown.....H. B. Drew  
Cue tip holder.....O. G. Page  
Cultivator.....C. A. Thurmond  
Cultivator, harrow, and hiller. Combined gang.....A. Fischer et al  
Cycle pedal and crank pin.....I. Rees  
Cyclometer and speed indicator. Combined.....2 pats.....E. D. Clapp  
Cylinder wrench.....H. Lund  
Dental chair.....3 pats.....G. Sibley  
Dental chair arm rest.....G. Sibley  
Dental chair back rest.....G. Sibley  
Dental flask.....T. G. Donaldson  
Dental tool.....C. W. Miller  
Dentistry. Impressionband for.....G. Evans

Denture. Artificial.....J. H. Doyle  
Deodorizing and drying.....F. M. Pratt  
Desk. School.....F. H. Swann et al  
Desk-slide.....T. J. Houtman  
Diving and submarine apparatus.....G. Pino  
Door hanger.....J. D. Cael  
Dough preparing apparatus.....J. Schweitzer  
Drill rotating device. Rotary.....J. B. Rhodes  
Drugget pin.....J. H. Gibson  
Dye. Green-back.....J. Abel  
Dyeing apparatus.....J. Major  
Dyeing &c. Apparatus for.....2 pats.....J. Major  
Egg-case.....J. M. Sharp  
Egg-case fillers.....J. T. Carmody  
Electric circuit breaker.....L. C. Reed  
Electric currents. Protective system and apparatus for high tension.....L. C. Reed  
Electrical distribution. Protective system of.....L. C. Reed  
Electric drill &c.....W. P. Freeman  
Electric machine. Dynamo.....H. G. Reist  
Electric motor controller.....M. W. Day  
Electric switch.....N. Marshall  
Electric conductors. Tool for laying conduits for.....J. F. Cummings  
Electrical distribution. Series arc system of.....W. B. Reed et al  
Electrical distribution system.....B. G. Lamme  
Electrical distribution system.....L. C. Reed  
Electrical distribution system.....W. B. Reed et al  
Electrical distribution. System of overhead.....W. B. Reed et al  
Electrical distribution.....W. B. Reed et al  
Electromotive force regulation.....B. G. Lamme  
Embroidery frame.....C. G. Guyer et al  
Envelope or folder. Document.....W. D. Bradstreet  
Extensible and adjustable bracket.....R. Beck  
Extract making apparatus.....E. Schlemann et al  
Eyeletting machine.....2 pats.....L. C. Emerson  
Fabrics. Composition for treating textile.....C. Green  
Fabrics. Producing.....M. H. Frank  
Feed water regulator.....2 pats.....A. R. Shattuck  
Fence. Portable.....J. C. Alexander  
Fifth-wheel.....F. E. Wilcox  
Filtering material.....J. R. Reid  
Firearm safety lock.....H. M. Caldwell  
Firearm sight.....G. Durrenberger  
Firemen's hose. Play-pipe for.....J. M. Baker  
Fireproof composition for building purposes.....H. W. Hathway  
Fireproof construction.....3 pats.....A. L. A. Himmelwright  
Fireproof construction.....4 pats.....W. Orr  
Fireproof pulpboard. Making.....F. E. Keyes  
Fish hook or animal trap.....D. W. Anderson  
Floor covering. Producing material for.....A. Mayke et al  
Floors. False work for centering concrete or other.....J. L. Lechner  
Floors, roofs, &c. Composition for making.....C. W. Kane  
Flower or plant. Artificial.....A. A. Richter  
Flower-pot holder.....V. I. Merton  
Fuel economizer.....D. Rusworth  
Furnace.....F. A. Daley  
Furring rod holder.....W. Orr  
Fuse-block.....H. P. Davis  
Galvanizing apparatus.....E. I. Braddock  
Game counter.....H. H. Byrne  
Garbage furnace.....S. H. Brown  
Garment.....L. H. Johnson  
Gas apparatus. Acetylene.....F. S. Hutchinson  
Gas burner.....F. W. Magee  
Gas burner. Acetylene.....W. Hahn  
Gas burning for heating purposes.....A. Seyewetz  
Gas manufacturing apparatus.....H. Pettibone  
Gas engine.....A. T. Otto  
Gas fixture key attachment.....P. A. Florimont  
Gas generator. Acetylene.....W. C. Homan  
Gas generator. Acetylene.....P. Laperie et al  
Gas lighter. Electric.....C. Hubert  
Gas meter.....V. Konopinski  
Gas regulator.....F. McBeth  
Gas valve and apparatus. Oil.....S. Guthrie  
Gear. Bevel.....J. Arthur  
Gearing. Drive.....I. F. Wales  
Gearing. Variable speed.....C. E. Brooks  
Globe hanger. Safety.....G. W. Biester  
Governor. Engine speed.....R. F. C. Keats  
Gramophone.....H. K. Smith  
Gramophone-reproducer.....W. Hart  
Grate. Fire.....J. J. Long  
Griddle greaser.....F. N. Cline  
Grinding machine foot stock.....A. B. Landis  
Grinding milling cutters. Machine for.....F. Schmaltz  
Gun. Automatic.....A. T. Dawson et al  
Gun sight.....A. R. Douglass  
Hammer. Foot power.....F. W. Forster  
Hand brake.....M. Y. Warren  
Harp.....G. F. Lyon  
Harrow and roller. Combined.....J. C. Imboden  
Harvester knitter.....A. Heusch  
Hay or straw cutter.....G. Comfort  
Hearse attachment.....M. M. Gmiley  
Heater.....S. Boal  
Heating system. Steam.....C. A. Ball  
Hog scraping machine stop mechanism.....H. C. Gardner  
Hoisting apparatus.....N. C. Mills  
Hook.....W. V. Lawton  
Horseshoe. Rubber tread.....W. P. Strawmyer et al  
Horseshoes. Nail for unevenly worn.....W. J. Beck  
Hot blast valve.....J. Kennedy  
Hub. Flexible wheel.....S. Colt  
Hub. Sectional vehicle.....W. Horner  
Ignition system.....W. H. Humphrey  
Impact motor.....R. Messenger  
Index holder. Card.....D. E. Hunter  
Ingot-mold and sink-head lining-brick therefor.....J. K. Griffith  
Insect or worm destroyer.....W. J. Barber  
Insulator for use on electric railways.....J. Thomas et al  
Internal combustion engine.....B. M. Aslakson  
Internal combustion engine.....A. J. Prith  
Internal combustion engine.....J. E. Thornton et al  
Iron or steel. Treatment of scrap.....M. McDowell  
Kettle. Chocolate.....W. Walter  
Knockdown box.....J. Shellenberger et al  
Ladder leveling attachment.....Step. W. A. Baetz  
Ladling device.....W. Lanyon et al  
Lamp.....J. M. Pfaulder  
Lamp.....F. T. Williams  
Lamp. Acetylene gas.....P. F. McCaffrey et al  
Lamp. Acetylene gas generating.....S. P. Hallows et al  
Lamp. Acetylene gas generating.....F. W. Hedgeland

Lamp burner.....J. M. Pfaulder  
Lamp. Electric arc.....2 pats.....T. E. Adams  
Lamp. Electric arc.....E. M. Barnes  
Lamp. Electric arc.....W. J. Davy  
Lamp. Electric bicycle.....G. Heidel  
Lamp. Electric glow.....2 pats.....J. Van Vleck  
Lamp. Electric glow.....J. Van Vleck et al  
Lantern. Hand.....F. W. Dressel  
Lap robe. Plush.....J. Stroock  
Last attachment.....J. F. Lyons  
Latch. Door.....F. E. Richardson  
Lemon squeezer.....J. L. Easley  
Lever shears.....F. A. Williams  
Limb. Artificial.....L. E. Hurlinger et al  
Lock.....A. R. Fergusson  
Loom attachment.....P. Lambert  
Loom box motion.....J. W. Small  
Loom shuttle box.....H. Wyman  
Loom shuttle checking and releasing mechanism.....H. I. Harriman  
Loom shuttle tension device.....F. Carpentier  
Lowering apparatus. Safety.....D. M. Collins  
Lozenge making machine.....F. H. Marker  
Lubricator.....H. Woods  
Mail bag catcher and deliverer.....G. W. Culver  
Measuring instrument. Electrical.....2 pats.....A. H. Hoyt  
Mechanical movement.....J. W. Moore et al  
Metal strips. Pickling.....E. I. Braddock  
Metallic carbonates by electrolysis. Manufacturing.....J. W. Richards et al  
Milk for stock. Apparatus for heating.....C. H. Mower  
Mining purposes. Hydraulic press for.....A. J. Tonge et al  
Moistening apparatus.....M. J. Buckley  
Mop-head.....G. A. Kahl  
Mop-wringer.....G. A. Kahl  
Motion-converting mechanism.....H. W. Meyer  
Motor.....W. Cline  
Mower. Lawn.....T. Coldwell  
Musical instrument.....J. C. Deagan  
Musical instrument.....C. H. Froelich  
Nail machine. Wire.....W. J. Hutchins  
Nail-puller.....J. Deebie  
Neck-tie holder.....W. A. Nurdyke  
Nest. Hen's.....G. H. Uzzelle  
Nut-lock.....F. W. Crozier  
Nut-lock.....J. Pearson  
Nut-lock.....B. F. Volter  
Oat-clipping machine.....W. Mathews  
Oil-can. Non-explosive.....J. A. Gray et al  
Oil-can. Non-explosive.....E. Shade et al  
Oleomargarine. Acidifying milk for manufacturing.....W. Muller  
Ordnance working apparatus.....R. Mathews  
Ores. Solvent for leaching.....R. W. Kennedy  
Packing. Metallic.....A. L. Dudley  
Packing. Piston-rod.....F. F. Swain  
Paper box.....R. Gair  
Paper box machine.....C. Beck  
Paper boxes. Machine for cutting holes in.....C. Beck Jr  
Paper-coating machine.....W. P. Wood  
Paper making machine suction box.....S. W. Shearer  
Paste box and dauber. Combined.....E. T. Gilbert  
Pedal.....2 pats.....W. Diebel  
Photographic washing apparatus.....W. F. Crawford  
Pianoforte scale bridge bar.....J. H. Ludwig  
Picking machine.....E. H. Blossom  
Pie-rack.....W. H. Mayo  
Piles in foreshores. Apparatus for fixing.....E. Case  
Pipe. Bead ring-mold for casting.....C. W. Osborn  
Pipe cleaner.....O. Spahr  
Piston joint. Fluid pressure.....R. C. Sayer  
Planter. Corn.....U. Shaeffer  
Planter. Seed.....C. W. Ingram  
Plastic material. Machine for mixing and preparing.....P. L. Sylvester  
Plow attachment.....E. H. Gurney  
Plow or cultivator wheel-frame.....J. B. Sells  
Plow-stock.....J. W. Fillip et al  
Plow swivel.....F. H. Nichols  
Pocket. Garment safety.....M. Bernstein  
Portable engine for tools.....J. F. Allen  
Pottery-kilns. Stand for trial pieces for.....J. P. Holdcroft et al  
Preheating tube.....A. Kitson  
Printing machine. Color.....S. L. Deleuil  
Printing press gripper.....T. G. Jenkins et al  
Pump. Electric.....C. Eickemeyer  
Pump. Lift and force.....S. H. Kerfoot  
Pump. Steam.....W. E. Eby  
Pump. Steam vacuum.....F. R. Crumbaker  
Pumping machinery.....D. H. Maury, Jr  
Racket.....F. L. Siazenger  
Railjoint.....G. W. Palmer  
Railway.....S. B. Dickinson et al  
Railway crossing. Automatic switch for.....J. E. Berkstresser  
Railway. Electric.....W. B. Reed et al  
Railway rail joints. Construction of.....E. M. McVicker  
Railway signal apparatus.....D. Colien  
Railway signal. Electric.....J. Shoecraft  
Railway signaling system and apparatus therefor.....H. Bezer  
Railway. Third rail electric.....B. C. Seaton  
Railway tie.....A. L. A. Himmelwright  
Railway tie receiver.....B. E. Homan  
Railway. Underground electric.....G. W. Smith  
Razor. Safety.....A. W. Scheuber  
Reamer. Reversible.....P. Grabler  
Reclining chair.....C. W. McCall  
Refrigerating apparatus for cold storage chambers.....C. W. Blagg  
Refrigerating surfaces. Preventing formation of frost on.....M. Cooper  
Refrigerator.....J. Nash  
River-bottoms. Machine for cutting grass, &c., from.....J. Allen  
Riveting-machine.....J. F. Johnson  
Roasting-machine.....C. F. Shoemaker  
Rock drill.....J. McCulloch  
Rod straightening and finishing machine.....J. Illingworth  
Rolling mill.....J. Kennedy  
Roofing-lap.....W. P. Whitmore  
Rotary engine.....J. Brons  
Rotary engine.....A. Dahlin  
Rotary engine.....R. E. Dixon  
Rotary engine. Compound.....A. Watkins  
Rubber fastener.....H. C. Paine et al  
Saddle. Harness.....J. H. Wheeler  
Safety hook, ring, &c.....H. G. Woodford  
Safety-pin.....G. P. Farmer  
Sales and cash register.....C. J. D. Walter et al  
Sample holder.....H. J. Breeze  
Sash balance.....T. M. Spinks

Sash. Window.....M. Zugermaier  
Scale. Multiple.....R. W. Bailey  
Scraper-blades. Machine for setting or forming.....J. B. Smith  
Scraper. Land.....G. M. Light  
Screw-driver.....G. E. Gay  
Screw-tap.....C. A. Svensson  
Scutcher-drums. Holder for packing of.....W. Frost  
Seam rubbing and cleaning machine.....J. B. Hadaway  
Seed-conveyer.....J. E. Johnson  
Sewing machine. Shoe.....2 pats.....J. W. Melton  
Sewing machine stop motion.....J. T. Hogan  
Sewing machine trimmer.....A. L. Traver  
Shade. Lawn.....J. H. Fry  
Shade-roller bracket.....J. Stone  
Sharpeners. Knife or scissors.....M. L. Hawks  
Shell. Explosive.....J. J. Conveys  
Shipping-box. Wooden.....E. H. Barnes  
Shirt. Apparel.....F. J. Schaffer  
Sickle-bar adjuster.....M. Anfinson  
Sideboard attachment.....A. M. Wiswell et al  
Sifter. Ash.....G. P. Harrison  
Size-powder. Making.....L. Beck  
Skirt-supporter.....J. M. Flanery  
Sled-brake. Screw.....H. M. Gifford  
Sluice box.....J. Milan  
Snatch-block.....W. W. Bouse  
Sole-leveling machine.....E. E. Winkley  
Speed-recorder.....J. Karlik  
Spinning. twisting, doubling, and winding machine. Spindle for.....C. Bergmann  
Spoon. Corn-cutting.....J. A. Crandall  
Spray.....R. F. Dull  
Stable-fork.....P. C. Nelson  
Stanchion. Cattle.....A. Joest  
Stapling machine.....M. V. Allen  
Steam-trap.....W. J. Baldwin  
Stocking-foot.....M. Friedlander  
Stone. Manufacturing artificial.....A. Ulrich  
Stool or seat. Folding.....F. Yunk  
Store service apparatus.....G. Staib  
Stove-pipe. Nestable.....A. Ohnemus  
Street-sweeper.....A. H. Greely et al  
Suspenders.....F. H. Peelle  
Swimming device.....M. Gates  
Switchboard. Electric.....J. H. Bunnell  
Tablet. Writing.....H. E. Youtsey  
Target apparatus.....J. L. McCullough  
Telegraph-sounder.....S. F. Lively  
Telephone-circuit selective signal.....G. K. Thompson et al  
Telephone coin-actuated mechanism.....A. F. Wines  
Telephone guard.....L. B. Ordway  
Telephone signal-circuit.....D. McNeil  
Telephone system.....J. W. Gore  
Telephone-transmitter.....J. M. Wilderman et al  
Tellurian.....J. P. McDaniel et al  
Temperature-equalizing coils. Manufacturing.....F. Allen  
Thill-coupling.....C. E. Stone  
Tire armor. Vehicle.....R. Cousins  
Tire for bicycles or other vehicle wheels.....W. Lennard-Foote  
Tire for vehicle-wheels. Pneumatic.....J. F. Bradley  
Tooth-crown. Artificial.....H. D. Justi  
Toothpick. Machine for pointing wooden.....W. H. Dyer  
Top. Spinning.....M. M. Henry  
Torch. Signal.....O. V. Wood  
Traction-engine.....R. Knight et al  
Tramway System. Rope.....J. T. Ludlow  
Transformer.....E. Arnold  
Traveler's box.....T. McCarthy  
Tricycle.....J. R. Rowlands  
Twine cutter.....G. A. McCartney  
Type-bar hanger. Duplex.....E. A. Honbostel Sr. et al  
Type making and composing machine.....M. W. Smith  
Vacuum tube lighting.....2 pats.....D. M. Moore  
Valve.....L. C. Eisenhut  
Valve cup.....M. T. Pew  
Valve. Disk.....H. Panhorst  
Valve. Hydraulic.....C. Kuhlewind  
Vapor burners. Swinging alcohol cup for.....A. Kitson  
Vegetable cutter.....G. B. Greaser  
Vehicle equalizing spring.....W. E. Hahn et al  
Vehicle lantern holder.....A. R. W. Knight  
Vehicle. Motor.....A. Bink  
Vehicle. Motor.....E. Fahf  
Vehicle. Motor.....H. A. Frantz  
Vehicle. Motor.....C. O. Hergem  
Vehicle. Motor driven.....J. E. Thornton et al  
Velocipede or like vehicle.....W. H. Miller  
Vending and indicating apparatus. Automatic.....W. Northorpe  
Violin or other stringed instrument.....J. M. A. Stroh  
Washboard.....A. W. Bishoff  
Washing machine.....D. Biggs  
Washing machine.....F. H. Seashals  
Waste products. Device for removing.....M. W. Forster  
Watch safety device.....J. Saveland  
Water closets, &c. Flushing apparatus for.....F. Wangelin  
Water motor. Impact.....D. P. Sims  
Water supply system. Pneumatic.....F. Kinsman  
Water wheel.....W. Ronkainen  
Waterproofing compound (reissue).....W. A. Hall  
Wave power motor.....W. Newell  
Wells. Device or tool for extracting obstructions from deep.....C. A. Penticoff  
Welt guide.....C. A. Pittroff  
Wheel.....H. Crawford et al  
Wheel rim and tire. Vehicle.....C. Miller  
Winch. Portable.....C. H. Roberts  
Winding machine. Thread.....R. Morrison  
Windmill governor mechanism.....A. T. Scott  
Wire-clamp.....M. D. Kilmer et al  
Wire hanger.....J. W. L. Jaques  
Wire stretcher.....J. N. Andrews  
Wires, wire ropes, cables, &c., through conduits. Apparatus for forcing.....J. Wrigley  
Work bench.....W. Vanderman  
Wrapping machine.....H. Rose  
Wrench.....T. Jensen  
X-ray apparatus. Induction coil for.....R. A. Fessenden  
Canadian Patents may now be obtained by the inventors for any of the inventions named in the foregoing list, provided they are simple, at a cost of \$30 each. If complicated the cost will be a little more. For full instructions address E. G. Siggers, 918 F Street, N. W. Washington, D. C. Other foreign patents may also be obtained.



### Increasing the Efficiency of Steam Engines.

It is well known that the steam boiler and engine, notwithstanding all improvements which they have undergone during the past hundred years and their incalculable services to mankind, are nevertheless wasteful and extravagant devices for converting the energy stored in fuel into mechanical power. The ordinary simple high pressure engine, which, after passing steam through one cylinder, discharges it into the air, utilizes hardly more than 5 per cent of the value of the fuel consumed in its boiler. The compound engine, in which the steam, after passing successively through two, three or more cylinders, is condensed, and the warm water of condensation restored to the boiler, utilizes under favorable conditions 12 to 13 per cent of the fuel energy, and there the economy appears to have stopped. An eminent American engineer has recently published an article reviewing the development of the steam engine, and closes his essay with the expressed opinion that with

has a temperature of about 100 degrees Celsius (212 degrees F.); when it passes into a condenser, the steam has a temperature of 60 to 70 degrees Celsius (140 to 160 degrees F.), according to the vacuum. The corresponding latent heat of steam, given up on change of form from steam to hot water, has hitherto run to waste in the condensing or cooling water, or in the air. Messrs Behrend and Zimmermann attacked this problem of utilizing this wasted caloric by employing it to create a new supply of steam by evaporating some liquid which has a lower boiling point than water, and for this purpose they chose, after many experiments, sulphuric acid ( $H_2SO_3$ ) which is not only cheap and easily obtained, but has the further advantage of a viscous consistency which lubricates the inner working surfaces of the machinery without corroding them. Their demonstrations, although not practically conclusive, were so promising that Professor Josse, a technical authority on this subject, took up the problem, and after several months of highly satis-

After passing through this cylinder, the sulphurous vapor enters the surface condenser, around the tubes of which cold water flows as in an ordinary steam plant. Here the sulphurous vapor is condensed to a liquid and is forced by the pump P back into the vaporizer, where it begins its cycle again, the same  $SO_2$  being used over again indefinitely. There are therefore, in fact, two condensers, the first serving, as it were, as a boiler or steam generator for the auxiliary engine; and this boiler, instead of being fired by coal, obtains all its heat from the auxiliary engine, and, instead of converting water into steam, evaporates a liquid which is much more volatile—i. e., has a far lower boiling point.

In the long series of recorded tests with the plant shown in the engraving the following results were obtained.

The steam engine is of the compound type, of good, modern construction, and, being given a steady load, developed 34 indicated horsepower, with a consumption of 8.6 kilograms (18.96 pounds) of steam per indicated

responding to a temperature of 60° Celsius (140° F.), the saving of heat must be accomplished by using a liquid which can be vaporized to a high pressure at or below that temperature. Assuming, further, the upper and lower limits of temperature within which the operation is confined to be 60° and 20° Celsius (140° and 67° F.), the pressure of the sulphurous vapor would range from 10.05 down to 1.35 atmospheres above open-air pressure. A working pressure as high as ordinary steam boiler pressure is therefore readily obtained at a comparatively moderate temperature. Moreover, the volume of sulphurous-acid vapor necessary to contain the number of heat units corresponding to the work to be performed is much smaller than the volume of steam which would be required for the same purpose. As the saving to be effected by the auxiliary engine depends directly upon the difference between the highest and lowest temperatures involved, the greatest gain will therefore be made either when the water in the surface condenser is as cold as possible, or when the heat of the exhaust steam from the engine is at a maximum, as is the case with a single-cylinder engine without condenser, which may be anywhere up to 212° F.

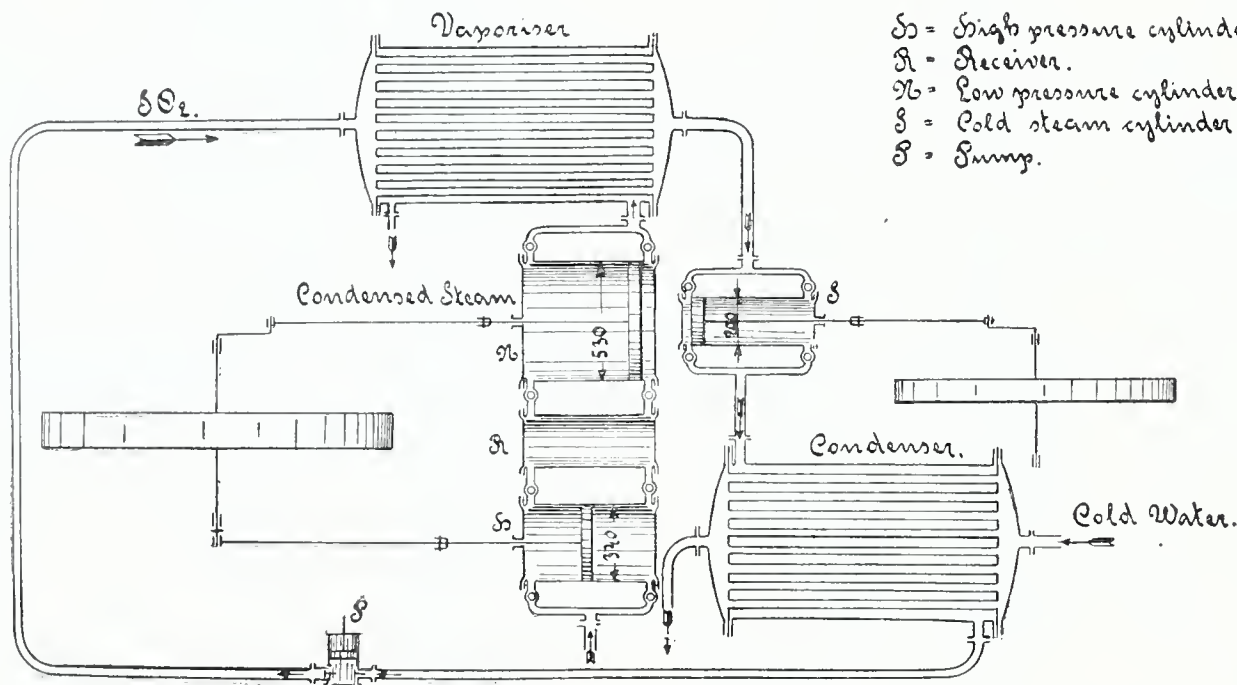
The expense of this improvement is practically all in the construction cost of the vaporizer; condenser, and auxiliary engine itself, and its economy may be realized from the fact that the exhaust steam from a 2,000 horsepower central-station engine should furnish power to drive an additional 1,000-horsepower engine, which can be connected as an extra cylinder to the steam engine or run independently, and thus increase by 50 per cent the power developed without adding a pound to the quantity of fuel consumed. When, in view of the present coal famine throughout Europe, it is remembered that the steam engine energy of Germany alone, afloat and ashore, is not less than 3,717,264 horsepower, the commercial importance of such an improvement will be readily apparent. Report of U. S. Consul, Frank H. Mason, to the State Dept.

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the compound machines and improved cut-offs of recent years, the practical limit of the efficiency of the steam engine has been reached. An invention described by Professor Josse introduces a novel element into the problem and opens a new chapter in the record of steam-engine development.

The process is the joint discovery of Mr. Behrend, a Hamburg engineer, and Dr. Zimmermann, of Ludwigshafen; and, although first patented in 1889, it has only recently been matured and its application perfected by the employment of an auxiliary engine, which, utilizing the heat contained in the exhaust steam, gains as high as 56 per cent additional motive power without increasing the expenditure of fuel. The principle and process involved are simple and may be briefly described as follows:

It is plain that, with all progress which has hitherto been made in steam-engine practice through higher pressures, superheated steam, economical cut-offs, or successive cylinders, there is always an important and inevitable loss of heat energy when the steam, having done its work, is discharged into the open air or changed back to water by contact with cold water in a condenser. When the exhaust is into the open air the steam

factory laboratory experiment, caused to be constructed and connected with an ordinary working steam engine of the compound type, an additional condenser and auxiliary engine, the power of which could be exactly measured. The technical details will be explained by the drawing, and may be thus described:

Referring to the diagram, in which dimensions are given in millimeters, H and N represent the high and low pressure cylinders of an ordinary compound steam engine, with a stroke of 500 millimeters (19.69 inches) and a speed of 41.5 revolutions per minute. From the low pressure cylinder N the exhaust steam passes into the surface condenser, called in the diagram the "vaporizer." In this vaporizer, or condenser, the cooling medium used instead of water is liquid sulphurous acid ( $H_2SO_3$ ), which has a boiling point so low that it is immediately decomposed by the heat of the exhaust steam, whereby the sulphur dioxide gas ( $SO_2$ ) is liberated, which passes over into the cylinder of the auxiliary engine S, where its work is done as in the ordinary steam engine. The auxiliary cylinder has a diameter of 300 millimeters (11.81 inches) and a stroke of 500 millimeters, with a speed of 77 revolutions per minute.

horsepower hour. The auxiliary machine working with the sulphurous vapor indicated 19 horsepower—that is, an increase of 56 per cent and yielding, instead of 1 horsepower, 1.56 horsepower for the same steam consumption and reducing the steam consumption from 8.6 kilograms to 5.5 kilograms (from 18.96 to 12.13 pounds) per indicated horsepower.

The experiments showed on the average that for every 15 kilograms (33.169 pounds) of steam passing through the engine, 1 horse power could be gained in the auxiliary machine. Applied, therefore, to an ordinary single-cylinder steam engine, exhausting into the air at high temperature, the percentage of power saved by this new device would be very much higher than the economy reached in these experiments, which, as has been shown, were made with a highly improved compound engine. From the average of these experiments, it may be broadly stated that, given a fairly economical compound engine, using 7½ kilograms (16.5 pounds) of steam per indicated horsepower hour, half an indicated horsepower could be produced in the auxiliary machine for every indicated horsepower developed in the main engine. Assuming an average vacuum of 60 centimeters (26.62 inches), corre-



## Reform in the German Consular Service.

### THE VALUE OF THE PHILADELPHIA COMMERCIAL MUSEUM.

Consul General Guenther, at Frankfurt, Germany, reports to the State Department:

"The 'seniors' of the Merchant's Association of Berlin have addressed a memorial to the Prussian Secretary of Commerce, and at the same time to the Chancellor of the German Empire, which appears to be in response to an inquiry from the Secretary of Commerce, and states what reforms in the German consular service are deemed necessary. The following is a synopsis of the somewhat lengthy document: The main duty of the consul should be to make careful and detailed reports concerning economic occurrences in his consular district. These reports should give not only the figures of the exports and imports, but should also deal with the development of the commerce and the home industries of the country. The consul should be able to point out these conditions on his own initiative, as well as in response to inquiries from home. He should be well informed about commercial matters at home, as well as in touch with the business world of his district. Means should be at his disposal for travel, and he should be compensated for services rendered. Knowledge of the language of the country, as well as of the leading languages of the world, should be of prime consideration. The promotion system of Great Britain should be followed, whereby consuls are transferred between countries where the same language and similar economic conditions prevail, so that transfers of a consul from China to Russia, and thence to Spanish America, for example, should be avoided. Reports concerning the commerce of the foreign country should give comparisons with previous years and be published at home in such a manner as to reach all interested.

"The letter says that these requirements are more or less realized in foreign countries. The consuls of the United States of America especially have rendered very useful service to the commerce and industries of their home country, and have furnished proof that the establishment of commercial consulates bears rich fruit, in spite of the fact that a consul can hardly acquire such special knowledge of trade conditions in the several branches as an agent of some business house.

"It is recommended that the qualifications for appointment as consuls should be of a more practical nature and not so much the mere knowledge of law. It is stated that to carry out the reforms suggested, an increased appropriation for the consular service would be necessary, which may appear large compared to the present expenditure, but which would prove insignificant if the importance of the work accomplished is considered—that is, the increase of German commerce, especially the exports of German manufactures. The letter also calls attention to the great usefulness of the Philadelphia Commercial Museum."

This report is interesting from two standpoints: first, as a well deserved tribute to the United States consular service; second, the recognition of the value of the Philadelphia Commercial Museum. In this connection we call attention to H. R., Bill No. 887, (Senate No. 417), printed in another column, appropriating \$200,000 to the institution. The object of this appropriation is to enable the Commercial Museum to increase its facilities for the benefit of the American Manufacturer and Producer.

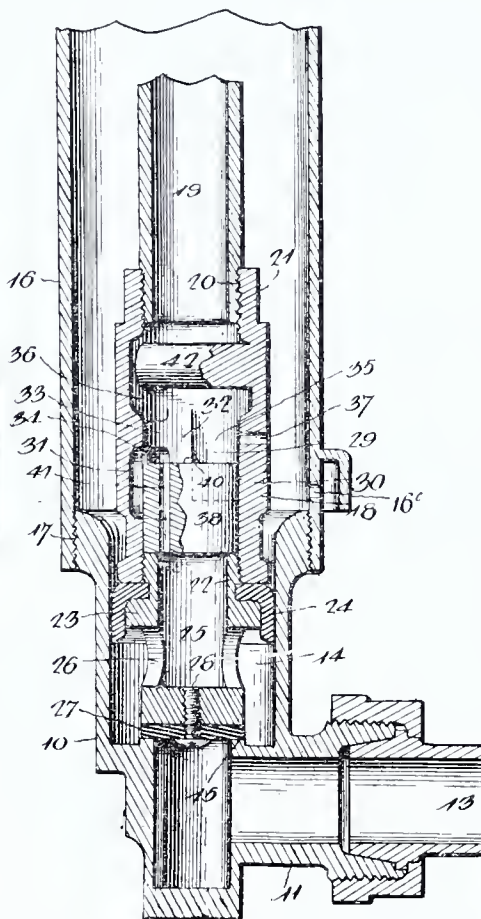
The work of the Institution has become so comprehensive that it is now serving all the principal American Manufacturers of the United States with the latest news regarding commercial openings for their particular products in all parts of the world. Its reputation has become national and its influence international. It is desired to make its usefulness more widespread, and to give commercial information, without charge, to Chambers of Commerce and other Trade Bodies throughout the United States. That this object may be properly accomplished, it has been thought proper to ask for government aid.

It is a work of importance to every manufacturer and exporter in the United States, whose assistance and influence in Congress on behalf of the bill are earnestly requested. The bill has already passed one of the Houses of Congress and it is hoped will soon become a law.

## RECENT PATENTS.

### Hydrant Valve.

A new waste valve for hydrants is worthy of attention. This is the invention of Horace F. Neumeyer, of Macungie, Pa. A small piston valve is arranged within a hollow plunger valve

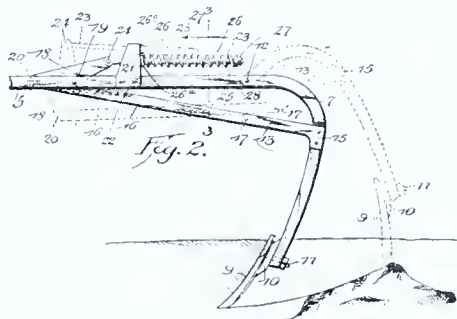


and the construction is such that when the main or plunger valve is closed the piston valve will be out of alignment with the waste opening, but when the plunger valve is opened, the piston valve is automatically operated by the pressure of the water to close the drain port before any water is permitted to

pass to the delivery pipe. By this means the delivery pipe is drained automatically of the water standing above the plunger valve, thereby preventing the water freezing in the pipe during cold weather.

### Cultivator Tooth.

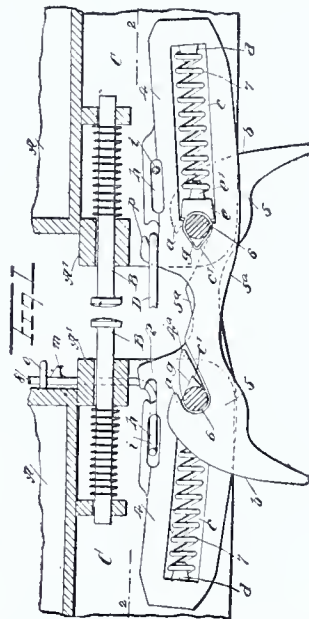
Messrs. Josiah S. Tuttle and John M. Wilson, of Kansas city, Kansas, have been granted a patent on a much needed improvement in cultivator teeth. The illustration presented herewith gives a very good idea of this invention. It consists in having the



shank of the tooth pivoted to the beam and held in operative position by an arm which is connected by suitable means to a coiled spring. The spring is strong enough to normally hold the tooth in operative position, but should a stone, root, stump, or other obstruction be encountered, the tooth will be forced back as shown in dotted lines, whereby the liability of injury to the tooth is minimized and the strain upon the shank overcome.

### Car Coupler.

Mr. A. R. Heath, of Covington, Ind. is the sole owner of an automatic gravity car coupler, as shown in the cut and which is covered by six U. S. Pat-



ents. It is adapted to be used on roads now equipped with the M. C. B. and O. S. couplers, its weight being one-sixth of the M. C. B. The draw bars and draft rigging are dispensed with.

Men are crushed daily between cars with the present appliance, and Mr. Heath claims such dangers are eliminated by using his coupler, which he will put on cars for forty cents royalty for each coupler.

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## DISBARMENT OF ATTORNEYS.

The following named attorneys have been disbarred from practice before the U. S. Patent Office.

William J. Haynes, Paris, Tenn.  
Thos. H. Stewart, Kalamazoo, Mich.  
Hampton E. Milliken, Bowling Green, Ky.  
Thos. C. Rollison, Cincinnati, Ohio

## PATENTS

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**E. G. SIGGERS**, Patent Attorney,  
(19 Years Actual Experience.)

918 F St., N. W. WASHINGTON, D. C.

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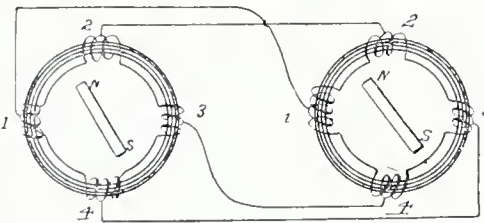
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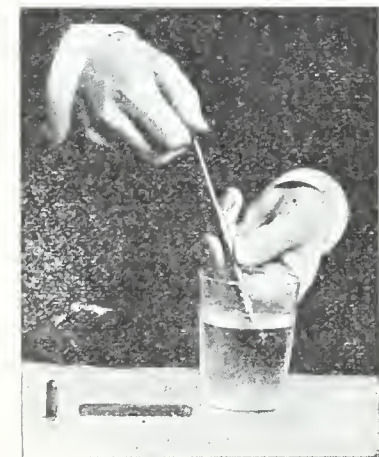


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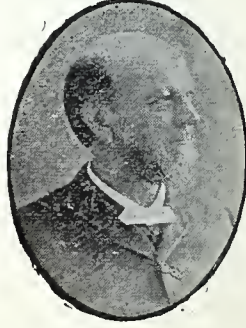
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## AND PATENT INDEX.

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### U. S. PATENT OFFICE.

#### DIVISION IX.

**Hydraulics: Methods of Raising Water and Using it for Power. Old Principles and New Applications.**

Division IX is one of the oldest in the Patent Office, and the arts which have always been examined therein, are, speaking generally, among the oldest in existence.

It is known as the division of Hydraulics, a term sufficiently accurate for a general designation, although there are devices properly to be called hydraulic which are not assigned to it. It formerly included Hydraulics and Pneumatics, but with the growth of the arts, the latter was assigned to Division XXVIII. The arts continuing to grow, the work of the Division became again very heavy, and in 1896 a further but less considerable reduction in its scope was made, in connection with other changes in the Office, by the transfer of the class Water Distribution, to Division IV. The classes embraced within its present limits are Pumps (for liquids), Hydraulic Motors, Fire Extinguishers, Baths, and Closets and Sewerage.

One of the earliest and most imperative needs of mankind was the elevation of water. If savages may rely for their water supply upon what can be found accessible in natural reservoirs, the crudest civilization, even sometimes when nomadic in character, requires wells, and with the wells some means for elevating the water. When Rebecca went to draw water at the well for her father's herd she probably employed a bucket with a cord attached. Applications are now frequently received in the United States Patent Office for improvements in what is fundamentally the same apparatus, a windlass being added to

facilitate the manual labor. Ewbank figures and describes the noria used by the ancient Egyptians; and the tympanum, described by Vitruvius near the beginning of the Christian era and in use earlier, have their essential principles repeated in some modern U. S. patents in the class of Rotary Pumps, while the "chain of pots" used in Joseph's well at Cairo, is by no means obsolete in the opinion of certain inventors, manufacturers and users. The then prevalent opinion that "Nature abhors a vacuum" which was doubted by Gal-

progress of invention be terminated by perfection. New wants, new opportunities, and, in consequence, new inventions and lines of invention are constantly being developed by new conditions. Since the new is always grafted upon the old, the greater the development of the old the greater the possibilities of the new. Old things in this art do indeed get themselves continually reinvented in a manner which is psychologically, if not mechanically, interesting. But at the same time, new types are continually being developed by invention, to re-

ed; which will run at high speed with economy of power, at a uniform rate and with a minimum of shocks and jars. In pursuit of these advantages many refinements of structure and combination are being introduced into pumps of many specific types, though usually within the general rotary and reciprocating types.

In the class of Hydraulic Motors are found, among other things, water wheels, the fundamental types of which, the breast, overshot and undershot wheels, and the turbine, are familiar to every school boy of moder-

ate advancement. These fundamental types, especially turbines, have been wonderfully and multifariously varied and improved. The struggle for perfection here has been persistently and skilfully conducted. There does not now appear to be room left in this art for radical improvements, unless in an attempt to meet peculiar conditions. The inventions now presented in this field, at least those presented by inventors who are abreast of the times in their knowledge of the subject, usually turn upon niceties of construction, and sometimes involve abstruse reasoning dealing with the more obscure parts of hydraulic science. But even in this field we find at least one comparatively recent



DIVISION IX, UNITED STATES PATENT OFFICE.

leo and experimentally refuted by Torricelli, was founded largely upon observation of the action of the suction pump, the origin of which cannot be stated but which was known in the fifteenth century, and which is, in its two forms, with valved or solid piston, the type of the great majority of the machines for which patents are asked in the class of Pumps.

It should not, however, be supposed that because inventions in pumps have so long a pedigree, this field of invention is now exhausted or nearly so. This class seems to illustrate, and go far to prove, the proposition that in no extensive art can the

place obsolete forms and to extend the art in its utilities. Among the more modern developments may be mentioned the improved forms of compressed air water elevators, and in particular those in which the compressed air is introduced into the rising column of liquid to lighten its specific gravity, whereby it will be overbalanced by a shorter column of pure liquid.

The effort of inventors at the present time is, very generally, to produce high duty pumps, for use in supplying cities, and in mines and the like, which can deliver water by millions of gallons per day, which shall be small and light in proportion to the work perform-

instance of the development of new wants and consequently new pioneer inventions out of new conditions. The Pelton (jet) water wheels, so called from the name of the first inventors in this line, were born of the enormous heads and small volumes of water found naturally available in some parts of the extreme Western portions of this country, to which they seem especially well adapted.

The greatest present activity in Hydraulic Motors is in motor mechanisms for operating elevators and presses, and sometimes for other purposes. These are complicated systems, and appear to be growing more





PRINCIPAL EXAMINER FRED M. TRYON.

so as inventive genius is more and more addressed to the "fine points" involved in the problem presented. It seems that the world will not, and perhaps cannot at its present stage of industrial development dispense with the advantages attendant upon the use of an incompressible and nonexpanding fluid as the immediately operative motive agent in machines of these classes. The Brahma press is a very familiar apparatus, of no mean importance in the history of the evolution of mechanics. The inventions in Hydraulic Motors for presses and for jacks are all variations of this fundamental type, but the steady-going machine of Brahma, if endowed with the power of observation and a knowledge of the modern arts, would scarcely recognize its own progeny in observing the lively and varied antics of some of these successors.

A small but interesting and apparently useful line of inventions consists in adaptations of hydraulic motors, used with pumps to feed them, to the propulsion of vehicles, such as street cars, bicycles and automobiles.

The perpetual motion crank finds in hydraulic devices, for motor or water elevating purposes, or both, a truly inviting field. A person of this class is seldom, if ever, more interested, or interesting, than when he has the conception of water running by its own force, applied through some ingenious mechanism, in an uninterrupted and eternal stream to the point desired above its source, at the supply port of a water wheel or elsewhere. These alleged inventions are often extremely ingenious. Assuredly it will require an ingenious apparatus to cheat nature, if that can ever be done. These applications are treated in the usual manner, as described in a recent number. If they get past the application room, a working model is required. No application of this kind has ever been known to survive that killing blow. The examiners are naturally curious to learn in each case precisely why the ingenious scheme will not work. This is sometimes difficult to discover, but has thus far always been ascertained.

The importance of machines and installations for extinguishing fires is conspicuous. Patents and applications in this line are classified in Fire

Extinguishers. Comparatively few of the patents in this class have reference to the familiar fire-engine which is really a compound of several inventions. It contains a vehicle, a steam engine, a steam boiler and furnace, and a pump. The last named is examined in Division IX, but not in the class of Fire Extinguishers. The rest are examined in other divisions. Some of the more meritorious and important inventions in Pumps have been especially intended for use in such machines, but only the few inventions which have reference to the manner of assembling these several parts are classified in Fire Extinguishers. That class does, however, contain some still more elaborate mechanisms, known as water towers, being systems of pipes and nozzles carried on trucks with appropriate rigging, which can be set upright when the fire is reached and elevated to a great height, being extensible by telescoping or some equivalent construction, whereby copious streams of water can be thrown over a roof or through elevated windows. The class also includes chemical engines, and various devices to be kept about a building to be promptly used in the emergency of fire, many of them designed to be automatically discharged by the heat of the fire to be extinguished. Some of them, besides the so-called chemical engines, operate by the union of chemicals to produce a fire extinguishing gas. But so far as can be judged from information accessible to the examiners, the most valuable part of the class, comprises the stationary installations of piping with their accessories, always automatic in modern practice, which are placed in the building to be protected and are designed to deliver promptly upon a fire, when it occurs, a shower of water derived from a street main or like source. A great amount of ingenuity, much of it of the more delicate and refining kind, has been expended upon these installations, with the result that millions of dollars worth of property have been saved from destruction, and the interest upon other millions is saved annually in reduced rates of insurance.

The importance of inventions classified in Baths and Closets, is of a different character, but is not inferior. This is *par excellence* the sanitary class. It does not, as a class, possess the antiquity of the other classes in the division already named, although its possibly most important subdivision, Water Closets, dates back in England more than a century. Baths were of course used by the ancients, and were well developed in the days of the Roman Empire. The development of the entire class is now rapid, and has been so for a number of years past. That development is no doubt associated with and accentuated by the modern great proportionate growth of large cities, the wants met by inventions in these lines being less easily met in city than in country life. Inventions in this class, although not usually involving great complication of mechanism, are of a character to interest the student of Physics and Patent Law, and are sometimes difficult to deal with, being ingenious applications of subtle physical principles.

The aggregate labor of examination of applications filed in the class is considerable.

The importance of the art of sewerage in actual practice does not appear to be well represented in the number or size of the applications for patents filed in the class bearing that title. Doubtless in this art, as in others, the inventions necessary to do the work required, under all conditions which have yet presented themselves, have been produced, and most of them patented, together with some not thus necessary. Further, the limits of the class touch, at several points, those of allied classes, which have absorbed devices which an outsider would consider related to the art of sewerage.

The Principal Examiner in charge of the division, Mr. Fred M. Tryon, was appointed an Assistant Examiner in the Patent Office May 6th, 1879. After passing through the several grades of Assistant Examiner, he was appointed a Principal Examiner in the spring of 1887, having already served for some seven months as Acting Examiner in charge of the Wood Working Division. He was soon after, in May 1887, placed in charge of Division IX, at which post he has since remained. The First Assistant Examiner, Mr. Porter D. Haskell, a graduate of the U. S. Naval Academy at Annapolis, has especial charge of the class Hydraulic Motors. He was appointed in the Patent Office Aug. 16th, 1886. Mr. David Moody, also a graduate of the Naval Academy, examines in the class of Baths and Closets. Mr. Moody has had much experience in the industrial arts outside of the Patent Office and his varied information thus gained has often been found of value. Pumps are mostly examined by Mr. Ralph N. Flint, a graduate of Cornell University, who has been upon this work since his first appointment in the Patent Office as Assistant Examiner, in July 1895, and has become very familiar with the contents of the class. Mr. Charles Lee Cooke, who has had a considerable and useful experience in the office and as attorney, examines Fire Extinguishers and Sewerage. The classes in the division as thus assigned are, with the exception of the last named, each too heavy for one Assistant to handle without help. The needed help is given by Assistant Examiner C. L. Rogers, who is a graduate of Alfred University. Mr. Rogers' services are not considered any the less valuable because not confined to one class of inventions, nor will his experience in the division probably be, for that reason, less useful to himself. Messrs. Tryon, Haskell and Flint have completed courses in law and are members of the bar, and Mr. Rogers is now pursuing such a course. This is a training always to be desired for members of the examining corps.

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## IMPORTANT COURT DECISIONS IN PATENT CAUSES.

### U. S. Circuit Court of Appeals. Sixth Circuit.

WESTINGHOUSE ELECTRIC AND MANUFACTURING COMPANY v. TRIUMPH ELECTRIC COMPANY. Decided October 3, 1899.

1. SCHMIDT-DESIGN PATENT-FRAME FOR ELECTRIC MACHINE—NON-INVENTION—VOID.

Design Letters Patent No. 21,416, issued March 22, 1892, to Albert Schmidt for the frame of an electric machine, the only originality claimed for which is the curvature of the bases of the pillars for supporting the shaft and of the supports to the cylinder-frame for the field, *Held* not to disclose patentable invention and to be void.

2. DESIGN-INVENTIVE GENIUS-PATENT-ABILITY.

As much inventive genius is required to support a design patent as a mechanical patent. (*Smith v. Saddle Co.*, 63 O. G., 912; *Northrop v. Anams*, O. G., 430; 2 B & A., 567, and *Forster v. Crossin*, 54 O. G., 1115; 44 Fed. Rep. 62, cited.)

3. SAME—CONSTRUCTION OF STATUTE—UTILITY.

The purpose of Congress in authorizing the granting of patents for designs was to give encouragement to the decorative arts. It contemplated not so much utility as appearance.

4. SAME—SAME—"USEFUL."

By the act of 1870, which was a revision as well as an amendment of the patent laws, the word "useful" in the design statute was transferred from the office of qualifying patterns and prints to that of qualifying shapes or configurations of matter.

5. SAME—SAME—"USEFUL" AS DISTINGUISHED FROM "VICIOUS."

The term "useful" was inserted in the design statute merely out of abundant caution to indicate that things which were vicious and had a tendency to corrupt and in this sense were not to be covered by the statute.

### DECISIONS OF THE COMMISSIONER OF PATENTS.

EX PARTE THE NEW ENGLAND GAS AND COKE COMPANY. Decided December 29, 1899.

1. LABEL DEFINED.

It is not necessary that a label be composed exclusively of words in ordinary use, used with their ordinary significance, or that it be in all respects such a placard as might be written by any one. Such construction would be inconsistent with the definition given by the standard dictionaries. (*Ex parte Moodie*, 28 O. G., 1271, construed.)

2. SAME—REGISTRABLE LABELS.

All labels which bear a name, title, address, or the like to indicate the nature, contents, ownership, destination, or other particulars of the thing to which they are to be applied, are proper subjects-matter for registration in the Patent Office under the law.

3. SAME—SAME.

Those which are mere labels, simply designating or describing the article, its nature, contents, or other characteristics in words which would naturally be used by any one who wished to



designate or describe the qualities or characteristics of the article which he wished to sell, arranged as they might be expected to be arranged by an experienced type-setter, involving in the choice of words or other arrangements nothing of originality, are clearly not intended to be the subject of an exclusive right. (*Higgins v. Keuffel*, 55 O. G., 1139, cited.)

#### 4. SAME—SAME.

A label in order that its owner may be entitled to be protected in an exclusive right thereto must under the authorities involve something of originality, some exercise of the creative power of the mind.

#### 5. SAME—SAME.

A label of artistic merit, indicating pictorially or otherwise, the article or the contents of the article to which it is intended to be applied, is entitled to protection; but it is not necessary to restrict registration to those labels which are artistic in a strict sense of the word.

#### 6. SAME—SAME—TRADE-MARK MATTER.

It is only necessary that labels, which are not trade-marks, in order to be registrable be other than such as would naturally be produced by an experienced type-setter using the expected skill of his calling in putting into an attractive form the statements furnished him of the characteristics of the article on which the label is to be used, whether such label be in a strict sense artistic or not.

#### 7. SAME—LABEL CONSIDERED AS A WHOLE.

A label must be considered as a whole, and the originality exercised in the creation of the part which forms its central portion gives originality to the whole.

#### 8. SAME—SAME—TRADE-MARK MATTER.

That a label as a whole is not a trade-mark, in the sense that it has not become by adoption and use the subject of an exclusive property right, may be accepted in the absence of any showing that it has ever been used as a trade-mark.

#### 9. SAME—DISTINCTION BETWEEN A LABEL AND A TRADE-MARK.

The distinction between a label, and a mark which may by adoption and use become a trade-mark, is that the one is essentially and obviously descriptive of the article to which it is applied, while the other is essentially arbitrary or fanciful, is at least not obviously descriptive, is distinctly different from a mark which would naturally be used by others to indicate the contents, nature, or quality, origin, destination, or purpose of the article to which it is applied.

#### 10. SAME—REFUSING REGISTRATION OF PRINT OR LABEL.

Registration of a print or label should not be refused, provided it is a print or label within the meaning of the law and is not a trade-mark, unless it is beyond question that it is absolutely without artistic or intellectual merit, is not original, and is not found in the creative powers of the mind.

EX PARTE FRASCH. Decided March 13, 1900.

#### 1. DIVISION—JURISDICTION OF THE COMMISSIONER.

The statute has always been regarded as authorizing a rule directing when more than one invention may be comprehended in one patent. That a

discretion in this particular is vested in the Commissioner is recognized and settled in numerous decisions of the courts.

#### 2. SAME—APPARATUS AND PROCESS.

That a machine or apparatus and process are separate and independent inventions seems to be well settled by the decisions of the courts and this Office.

#### 3. SAME—SAME—OFFICE POLICY—CLASSIFICATION.

The question whether claims for a process and claims for an apparatus should be permitted in the same application is one of Office, and it is wise to to exercise the discretion vested in the Commissioner and require that claims for a machine or apparatus and its process be presented in separate applications. The importance of classification and of a uniform practice in the Office is sufficient to warrant this.

#### 4. SAME—APPARATUS AND PROCESS EXAMINABLE IN DIFFERENT DIVISIONS OF THE OFFICE.

Because a process and an apparatus are examinable in the same division or in the same class is no reason why they should be permitted to remain in the same application. A decision based on that ground, while it might apply at the time it was made, may not apply to a similar case a short time thereafter. Divisions, classes, and subclasses are continually changing in the Office, and what might be in a certain division to-day might not be to-morrow, and were division required on such lines it would be unstable and subject to frequent changes.

#### 5. SAME—APPARATUS AND PROCESS—PROPERLY PREPARING APPLICATIONS.

If applications for process and apparatus are properly prepared and the line of division is properly made, the courts will not, judging from the past, hold one or the other patent invalid for the reason that the claims are contained in separate patents.

### Amended Rules of Practice.

DEPARTMENT OF THE INTERIOR,  
UNITED STATES PATENT OFFICE  
Washington, D. C., Feb. 1, 1900.

Rule 41 of the Rules of Practice of the United States Patent Office, edition of July 18, 1900, is amended by canceling the second paragraph thereof and substituting the following:

Claims for a machine and its product must be presented in separate applications.  
Claims for a machine and the process in the performance of which the machine is used must be presented in separate applications.  
Claims for a process and its product may be presented in the same application.

C. H. Duell,  
Commissioner.

DEPARTMENT OF THE INTERIOR,  
February 1, 1900.

Approved to take effect this day.

E. A. Hitchcock,  
Secretary of the Interior.

#### DISBARMENT OF ATTORNEYS.

The following named attorneys have been disbarred from practice before the U. S. Patent Office.

Geo. B. Gardner, Stoyestown, Pa.  
John M. White, Petersburg, Ind.  
Lorenzo D. Immell, St. Louis, Mo.

To keep themselves posted in the progress of the art in which they are interested, inventors and manufacturers should subscribe for the INVENTIVE AGE, which publishes a list of all patents issued each month. The low subscription price and the character of the publication, entitles it to the support of all the inventors of the country.

### RECENTLY PATENTED INVENTIONS AND DESIGNS

Procured through the Patent  
Soliciting Department of E. G. SIGGERS,  
Washington, D. C.

Reddin W. Parramore, New York, N. Y. Design for Hose Supporter.—This gentleman has a number of patents in this line, one of which was described in *The Inventive Age* of August 1899. The principal features of this design reside in a trapezoidal shaped body having a pair of oppositely located side wings and an arched crown piece which carries a looped projection. This construction is especially designed to be connected with the clasp of a corset, thus dispensing with safety pins and like fastenings which are injurious to the articles of clothing.

Eli Cayemberg, Rosiere, Wisconsin. Belt Guide for Threshing Machines.—The object of this invention is to provide means for guiding the driving-belt of the machine so as to prevent the oppositely moving sides from coming in contact or the deflection caused by wind pressure. This is accomplished by very simple and inexpensive means which consist in parallel rollers adjustably mounted on a tripod supporting frame which can be set up in any position.

Charley K. Dammen and Otto Bergquist, Northwood, Iowa. Fan for Baby Carriages.—A pair of swinging fans are arranged by suitable framework above the carriage, the lower ends of the frame being attached to the wheels. The carriage is connected by a rod to a rocking chair. When a person sitting in the chair rocks the same, the motion is communicated to the carriage and the fans are operated, thus keeping flies and insects from the baby and also fanning the person in the chair.

Otto F. Feix, Gloversville, N. Y. Abrasive Appliance.—This machine, which is for dressing leather, is an improvement on a former patent and simplifies the construction shown in that machine. The invention also includes improved feed and stretching mechanism whereby the hides are fed in taut condition to the abrasive devices. These advantages will be highly appreciated by those skilled in this art as the machine overcomes many defects of the machines heretofore used.

Albert A. Frankl, New York, N. Y. Curtain.—The curtain is particularly adapted for open street cars and like conveyances, and comprises a transparent section which allows light to enter the car and also permits a person to see outside. A flap is provided by means of which the window may be covered. This invention is a much needed improvement and should come into general use.

William F. Hines, Gnadenhutten, O. Acetylene Gas Generator.—This invention relates to that class of generators having a vertically movable gas tank. Means are provided for cooling and condensing the gas after its delivery from the generator to the storage tank. It also comprises means for carrying a large amount of carbide in separate compartments and bringing each compartment successively into service, thus making a machine of efficiency and economy.

James T. Holland, Stanton Depot, Tenn. Back Band Hook.—This device is designed not only to support the trace, but also to support it at different heights. It provides means whereby the height of the trace may be adjusted without detaching the same from the loop, and the device be-

ing very inexpensive will find great favor as it facilitates the adjustment of the harness.

Jesse O. Hunt, Cairo, Ill. Necktie Fastener.—While this invention is particularly designed for bow ties, it may be used with equal advantage on all kinds of ready-made neckware. It consists of a metallic forked portion, fastened to the tie, which engages the collar button, and a spring clamp carried by the forked portion which clamps over the collar button, thus securely holding the tie in place but allowing it to be easily removed. This positively prevents the tie slipping out of place and on that account will certainly come into general use.

Charles Kretschmer, Pueblo, Colorado. Whiffletree Coupling.—Two sections, fastened respectively to the whiffletree and the cross bar, are provided at their adjacent faces with interlocking concentric flanges. A brace extends from the top of the pivot bolt to a clip bar on the lower portion, and side braces are arranged on each side of the two members. This makes a strong coupling that increases the durability of the parts, and at the same time is simple and inexpensive.

Charles Kretschmer, Pueblo, Colorado. Wagon Standard.—A hollow standard, fastened to the bolster by new and improved means, is provided with a stake which is slidingly mounted therein. A pair of set screws arranged in the standard hold the stake at any desired height. The construction makes a durable standard, which can easily and quickly be adjusted to different heights, thus making a very useful device.

James M. Leaver, Bay Mills, Michigan. Doors, Shutters, etc.—The object of this invention is to provide a greatly cheapened construction of this class of articles without impairing their durability or usefulness. It consists of having a wooden frame or core, arranging sheets of pulp material, having suitable designs impressed therein, on each side of the core, and joining the pulp sheets to the core. By this means, an inexpensive article is furnished, that is durable, easily constructed and free from many of the defects of a door composed entirely of wood.

Henry Miller, Mexico, Pa. Plane Adjuster.—This invention provides an improved bit-adjusting device for planes, wherein means are provided for a compound adjustment, to wit, a longitudinal adjustment to secure the set, and a lateral adjustment to accurately center the bit. Improved means are also provided for securely holding the clamping plate, the whole construction being a great improvement in the art.

John B. Neuendorff, San Antonio, Texas. Churn.—The dasher is constructed in such a manner that when rotated it produces a vacuum which is supplied by air admitted through the dasher-staff. Motion is communicated to the dasher by peculiar and novel means from a drive wheel arranged on the side of the churn body. By this means a novel churn, simple in construction and positive in operation is provided, that presents many points of advantage over the ordinary rotary dasher.

Melvin Barber and Louis F. Kramer, Oklahoma, O. T. Sash Balance.—Instead of the ordinary counterbalancing weights, this invention comprises a spring drum mounted in the top of the window frame and having the cords attached thereto. The invention is an improvement over a previous patent, and is a cheap, reliable, and efficient balance.



# *Inventive Age*

## AND PATENT INDEX.

Established 1889.

### INVENTIVE AGE PUBLISHING CO.,

E. G. SIGGERS, PROPRIETOR, successor to  
C. A. SNOW & Co., in publishing the "AGE."  
National Union Building, 918 F Street, N. W.,  
WASHINGTON, D. C.

The INVENTIVE AGE is sent, postage prepaid, to any address in the United States, Canada, Mexico, Hawaii, and Porto Rico, for ONE DOLLAR a year; to any other country, postage prepaid, ONE DOLLAR AND A HALF.

Correspondence with inventors, mechanics, patentees, and manufacturers, is invited. The columns of this journal are open for the discussion of such subjects as are of general interest to its readers.

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WASHINGTON, D. C.

Entered at the Post-office as 2nd class matter.

WASHINGTON, APRIL, 1900.

### COAL WANTED.

#### Another Chance for Americans.

At the present time there appears to be a great opening for American coal in the old world. From all points come reports of the great scarcity of this staple article.

The Navy Department is informed that ordinary bituminous coal for steaming purposes is now \$10 a ton at Gibraltar. The same quality can be purchased for less than \$2 at Lambert's Point, Va.

In a recent report of the Vice-Consul-General at Frankfort, Germany, to the State Department, he says:

"There is a scarcity of, and great demand for, coal and coke, not only in Germany, but also in all other continental countries. Several industrial establishments in Cologne, owing to the want of coal, were lately obliged to stop work; one of these employed over 900 hands who are now idle. The scarcity in coke is most severely felt, and the iron and steel establishments, which paid 16 marks (\$3.80) per metric ton (2,204.6 pounds) this year on contract, must pay for additional requirements—to be satisfied in the open market—42 marks (\$9.99) per ton."

From Russia comes the same story. Many of the industrial establishments in Lodz, the center of Russian manufacture, have had to stop work or reduce the operating force for want of coal. The St. Petersburg Gazette states upon good authority that the present tariff rates on coal, iron, and cast iron will soon be reduced on importations destined for factories in the Baltic and St. Petersburg districts within 100 versts (66 miles) of the coast line.

Consul Skinner at Marseilles, France, reports to the State Department as follows:

"There is at this moment in France a coal famine, attributed to several causes, among which are the strikes inaugurated and threatened among French miners, the withdrawal of British miners from the collieries to join the army, the demand in Great Britain for domestic coal for manufacturing and emergency purposes,

and the great demand for coal in France to supply manufacturers who are rushed with hurry Exposition orders. Thousands of French operatives are either out of work or working intermittently because of the coal scarcity, and the burden to business is such that there is talk of repealing the duty on coal until the stringency is relieved.

"A Marseilles broker of highest standing communicates to me the following information as to prices:

The price of the best Cardiff coal delivered here in bunkers and in bond is fixed by the syndicate at 35s. (\$8.50) per ton. A very small quantity of coal (I understand about 500 tons) could be bought on the quay (duty paid) at 40 francs (\$7.72) per ton; but apart from this there does not seem to be any coal available for sale in the interior. I learn on good authority that the price of coal at Cardiff (best quality) has gone up to 30s. (\$7.30) per ton, and that there is a prospect of it touching 40s. (\$9.73)."

It is not necessary to seek very far for the cause of this condition. As is well known, England supplies the great bulk of coal to these foreign countries. The following article taken from an Italian paper and transmitted from Rome by Ambassador Draper applies with equal force to all of these countries. It is as follows:

"The increase in the price of coal in England threatens to have serious consequences in Italy. It is known that English dealers have taken advantage of the present war to maintain and increase the price of coal, which has now become even in England a luxury and has reached in certain towns the price of 45 francs (\$8.69) per ton.

Moreover, it is known that means of transport are becoming insufficient, the English Government having hired a large number of boats belonging to companies and to private individuals. The result of it is that coal may very soon reach the price of 50 francs (\$9.65) per ton in Genoa and 60 francs (\$11.58) in Milan."

The Ambassador adds:

"The situation, I think, is worthy the attention of coal mining enterprises in the United States. Italy depends mainly upon England for coal, and the price to the consumer is always high, even in times of peace; now it has gone up enormously. In view of these facts—the Italian high prices, the low cost per ton of American coal at the sea board, and the ocean freight rates—it appears to me that a large margin of profit is offered to American coal exporters."

For some time the price of coal has been rising steadily in London. Ordinarily coal sells in that city for 25 francs (\$4.83). Dealers have been good enough to advise the public that the price will advance to 50 francs (\$9.65), and it will soon probably jump to 100 francs (\$19.30), or rather it will cost nothing because there will be none to obtain.

The coal dealers declare that they can do nothing, as the Government has requisitioned all the available rolling stock for two months, to transport troops and war material. Moreover, every sack of coal that can be procured is being monopolized for the

foundries at Birmingham, Aldershot, and Woolwich and for the depot at Southampton.

All our consuls agree that our American coal mining and shipping companies should seize the opportunity to inaugurate a coal-export movement to Europe.

Already there have been considerable shipments from this country, and as is always the case with American products, the coal so shipped has proved greatly superior to that heretofore obtained.

### Design Patents.

The practice of the Patent Office in the matter of Design patents for the last two years has been exceedingly liberal. Most "any old thing" having a difference in shape, configuration or ornamentation over a prior device could be patented as a design, but this has been changed since the decision of the Circuit Court of Appeals of the Sixth Circuit, in the case of Westinghouse Electric and Manufacturing Company vs. Triumph Electric Company, printed in another column of this paper.

In this case, a design patent had been granted for the frame of an electric machine, the leading feature of the design being "the general configuration of the frame with the extensions which constitute the supporting pillars for a shaft," which, as stated, "give a pleasing appearance to the structure." The court held that the design patent was not valid for the reason that it failed to disclose a patentable invention, and reaffirmed the well-established doctrine that "as much inventive genius is required to support a design patent as a mechanical patent."

As a result of this decision, there has been a material decrease in the number of design patents granted, though we fancy that there have not been a less number of applications filed. We have thought for some time that a change would soon come, as it was not to be expected that manufacturing interests would long acknowledge the validity of design patents on some of the things which had been, and were being, protected. The expected has happened, and the practice will be different in the future. Inventors will have to hereafter present something more than a mere difference of form, and must show some utility for their inventions before a design patent will be issued.

### The Registration of Prints and Labels.

Following the decision of the Supreme Court of the United States, in the case of Higgins vs. Kenffel, 55 O. G., 1139, the Patent Office refused for a long time to grant certificates of registration for labels and prints, and for many months none were registered. There has, however, been a distinct modification of the practice in the last few months, and now prints and labels are being registered each week.

The authority to register prints and labels is conferred upon the Commissioner of Patents by a section of the copyright statute. Hence the protection afforded is akin to that given under the copyright law, but the distinction resides in the fact that the print or label, in order to be registerable in the Patent Office, must be associated with an article of manufacture, not connected with the fine arts.

Inasmuch as the Patent Office will return the fee on rejected applications for registration of labels and prints, it is quite likely that, unless there is a return to the old practice, the registra-

tion of prints and labels will increase, since the expense is considerably less than is incurred by the registration of a trade mark.

While there is some doubt as to how the Courts will pass on the validity of the registration of these labels and prints, it is quite certain that they will give at least copyright protection thereto.

In this connection the decision of the Assistant Commissioner of Patents, printed in another column, is well worth the consideration of manufacturers and others who have dealings with labels.

Under the present practice, a label of artistic merit, indicating pictorially or otherwise, the article or the contents of the article to which it is intended to be applied, is entitled to protection. It is not, however, intended by the Patent Office to restrict registration to those labels which are "artistic" in a strict sense of the word, for it is only necessary that labels, which are not trade-marks, in order to be registerable, be other than such as would be naturally produced by an experienced type-setter using the expected skill of his calling in putting into attractive form, the statement of the characteristics of the article on which the label is to be used. In plain language this means that any label, if it presents something more than would be expected from an ordinary job printer, and involves anything of originality on the part of the proprietor, is entitled to protection from the Patent Office, and the owner thereof can secure Letters-of-Registration thereon.

By a recent amendment of Rule 41 of the Rules of Practice of the Patent Office, an application for patent claiming both a process of making an article of manufacture and the product itself may be accepted, this being a concession from the practice announced June 18, 1899. This modification of the Rules, small though it may be, is regarded by inventors with considerable satisfaction.

It is to be regretted that the practice of the Patent Office has become so stringent on the question of division. We are constantly receiving letters from inventors complaining of the onerous effects of it. While the present policy of the Patent Office, on this subject, is dictated by a desire to adhere to the classification as closely as possible, and avoid too many cross references, (and to this extent inventors may be benefited in the end,) it is difficult to convince the average inventor of the justice of the present practice, when he knows he has to take out more patents to protect his inventions than he did ten years ago.

The work of the classification division is accomplishing wonders in bringing order out of chaos, and establishing a system which will stand for all time; but the Patent Office would earn the gratitude of the great body of inventors, if some way could be found to relieve the present condition somewhat by relaxing the practice which requires that where the claims of an applicant relate to inventions classified under different heads, separate applications must be made thereon. We do not consider the classification a safe rule to follow in requiring division. A far more equitable rule would be that where inventions have acquired a distinct status in the arts and industries, and are capable of use in other relations, division should be required. But, unfortunately for inventors, the Examiners at present are requiring applications to be divided in nearly every case where the claims relate to inventions classified under different subclasses, even though the claims can all be properly examined in their own Divisions. A return to the practice enunciated in *Ex parte Wilcox* and *Borton* would be accepted as a wise solution of this troublesome question.



## SEWAGE IRRIGATION

## PART III.

## Questions to be Considered. The Value of Sewage.

BY B. G. FOSTER.

In considering processes for the utilization of sewage, either in agriculture or for its direct purification by chemical methods or by intermittent filtration, it becomes necessary to learn, first of all, what quantity of sewage may be expected from a given population, and, inasmuch as the flow of sewage will vary with the quantity of water supply, the first inquiry would be properly directed toward ascertaining the amount of water used in American towns. It may be pointed out, however, that general discussion of this phase of the question can only be of use as indicating tested and approved methods of procedure. The conditions vary so greatly in different towns that each case must be taken by itself as a problem for special solution. For instance, the average daily consumption per capita is 203 gallons in Portland, Oregon, while it is only 40 gallons in Newton, Massachusetts. And these variations follow no spec-

gation, the same considerations lead to certainty and ease in the utilization as well as to decrease in the expense. In combined systems where the sewers receive the rainfall as well as the sewage proper it will be necessary to provide, in any purification project, for taking care of and properly purifying a considerable portion of the storm water at each rainfall.

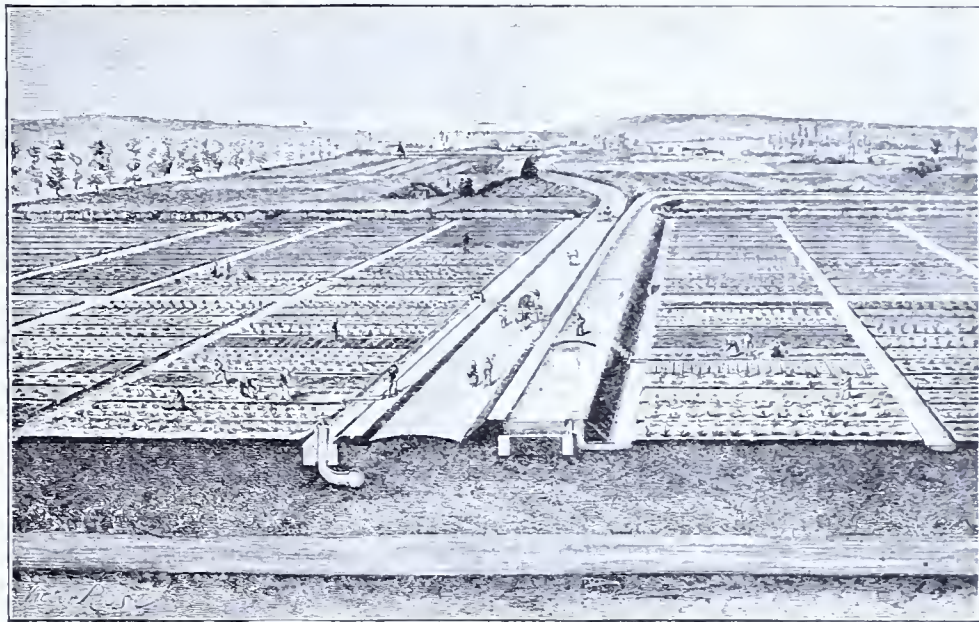
Very few people realize what a small percentage of sewage is detrimental to health. From the statements made by Mr. Mills in the special report of the Massachusetts State Board of Health, we draw the conclusion that the sewage of the average American towns contains something like 998 parts of water, 1 part of mineral matter, and 1 part of organic matter. The mineral matter, as it ordinarily exists in sewage, cannot be considered as specially harmful, so that from a sanitary point of view the whole object of sewage purification is chiefly to get rid of the one-thousandth part of organic matter.

From an agricultural point of view the nitrogen, phosphoric acid and potash are the most useful ingredients of sewage, and accordingly it becomes of interest to establish the quantity of these three elements which may be found in ordinary sewage. Taking that of about average composition, a net ton may be expected to contain nitrogen to the amount of from 0.15 to 0.25 pounds; phosphoric acid, from

ognition of this factor has placed sewage utilization on a somewhat different plane from that formerly occupied.

There is, however, another phase of the question. The main object of sewage purification is to keep streams pure and to preserve the health of the citizens of our cities and of the surrounding country. It has therefore been held, and very properly, that the

true, but it is believed, with the present experience, that in any region where the distribution of the rainfall is such that periods of drought are likely to occur at the critical period of growing crops, if sewage can be delivered upon agricultural lands by gravity, or even by a moderate pumping lift, a commercial saving will be effected, due to the irrigation value of the sewage, over any gain



DIAGRAMMATIC VIEW OF THE GENNEVILLIERS FIELDS, FRANCE.

real object of sewage treatment is purification and not utilization, and that utilization, by introducing commercial considerations, will inevitably tend to lower the degree of purification. It has been held, in short, that sewage purification is a right which one community or individual owes to another. This is well stated by Mr. Eliot C. Clark in his report to the Massachusetts Drainage Commission, in which he says, "If it is proper to dedicate land to use as a park for the pleasure of the public, there is no reason why it may not be dedicated to sewage purification in order to preserve health." It is held that this right is independent of any question of commercial profit, and while this proposition is undoubtedly true, it is believed that, with proper understanding of all the elements of the problem, a satisfactory utilization may also be attained without lowering the standard of purification.

Since the first development of sewage utilization in England the trade in commercial fertilizers has also

that can possibly be obtained by the use of commercial fertilizers alone. If pumping is required, its cost may, of course enter as a modifying element.

This thought should be placed before the scientific farmers of the United States as one well worthy of their most careful consideration. Furthermore it should be said that from the experience gained in other countries, as well as our own, there is no doubt but that frequently lands in the immediate vicinity of our cities and towns can be improved in productiveness more by the general application of sewage irrigation than by any other method at present open to our farmers.

It should be remembered, however, that the quality of soils will enter into the final solution of the problem. Those best suited for sewage irrigation are open, porous, gravelly soils, while heavy clay soils may demand so great an expense of preparation as to render sewage utilization, except in special cases, practically impossible. As already stated, each location pre-



SEWAGE IRRIGATION AT SALT LAKE CITY, UTAH.

ial law, so that the only way to proceed will be to consider each case on its merits. It may be stated, however, that in those towns where meters are being introduced, the tendency seems to be toward a reduction per capita of consumption.

In addition to variations in quantity of sewage due to varying uses of water in public supplies, frequently, variations will be found due to infiltration of drainage water into the sewers themselves, which will of course increase the flow of sewage over and above that due to the water supply, and to leakage from the sewers through gravel and other porous material and through the seams of rocks, which tends to decrease the flow below the amount due to the water supply. Both of these sources of variations will frequently operate to modify conclusions based upon water supply purely.

With separate systems of sewers, street washings are excluded, and the sewage, by reason of containing the house drainage only, has a much more uniform composition than is found in the sewage from combined systems; whence it results that the sewage from separate systems is somewhat more amenable to treatment, because of more uniform composition and on account of less variation in quantity. In case sewage is to be purified at sewerage-disposal works, both these considerations lead to decrease in first cost of the works as well as to decrease in annual expense of operation. In case of utilization of sewage for irri-

0.045 to 0.065 pounds; and potash, from 0.025 to 0.040 pounds. With nitrogen at 17 cents per pound, phosphoric acid at 7 cents, and potash at 5 cents, the theoretical value of the fertilizing ingredients of such sewage would be, per net ton, from about 3.5 cents to 4.5 or 5 cents. Taking into account, however, the various losses of the nitrogen, which is not only the most valuable but also the least stable element, as well as the expense of distribution, we may conclude that the manurial constituents of sewage have an actual value, when applied to good advantage in agricultural utilization, of from 1 to 2 cents or perhaps 3 cents per ton. We should note that this is the manurial value only.

Independent of the manure, the water of sewage has also a distinct value for irrigation. But by reason of the variation in local conditions, it is impossible to make any general statement of value which will apply to all cases, although in a general way we may say, taking into account the manurial constituents as well as the irrigation value of the water, that sewage, when applied to land at the best advantage, may be considered, with the present understanding of things, as worth from 2 to 4 cents per net ton. In some cases, by reason of its value for irrigation, it may be worth several times these figures.

We learn, then, that the irrigation value of sewage may be quite as important as the distinctively manurial value, and it is believed that the rec-



DISTRIBUTING CHANNEL, BERLIN, GERMANY SEWAGE FARM.

greatly extended, and many writers have taken the ground that at the prevailing prices of commercial fertilizers, agricultural lands can be manured more cheaply by their use than by the use of raw sewage. In regions where the distribution of the rainfall is such as to fairly meet the necessities of agriculture, this is probably

sents its own special problem, which, to some extent, will demand its own special solution independent of all other cases. It can not be too strongly insisted, therefore, that each case must be studied on its own merits.

(To be Continued.)



# PATENTS

ISSUED MARCH 13, 1900.

A full printed copy of drawing and specification of any patent in this list will be sent on receipt of 10 cents in postage stamps. Preserve this list for future reference and always send name, title of invention and date of issue.

INVENTIVE AGE PUBLISHING CO.,  
Washington, D. C.

Accumulator.....H. Leitner  
Acid cooling tower.....C. Ringaber  
Adhesive compound.....V. M. Bonthillier  
Adjusting device.....G. B. Petsche  
Advertising bombshell.....J. Scalona  
Advertising device.....E. A. Powell  
Air compressor, Hydraulic.....N. J. Lockyer  
Alarm mechanism, Time.....C. Schmidt  
Amalgamation, Separator for gold and silver by.....F. A. Rider  
Appliance for woman's wear.....C. C. Carr et al  
Auger, Post hole.....C. L. Tuttle  
Back pedaling brake.....A. F. Rockwell  
Bag holder.....F. H. Brooks  
Baking vessel or mold.....W. R. Wright  
Basket, Fruit.....W. O. White  
Bath cabinet.....J. E. Cross  
Bath tub, Portable.....J. W. McGregor  
Bearing, Antifriction.....I. Moss  
Bearing, Sleeve.....C. H. Bayley  
Bedstead attachment, Invalid.....E. A. Libby  
Bell striker.....F. W. Cole  
Bicycle.....K. Kieter  
Bicycle.....S. Lounsberry  
Bicycle brake.....W. S. Basler  
Bicycle driving mechanism.....A. A. Brown  
Bicycle fan attachment.....J. A. Mills  
Bicycle, Folding.....H. L. Trebert  
Bicycle gearing, Changeable.....G. S. Adams  
Bicycle saddle.....A. L. Garford  
Bicycle support.....F. Barry  
Binder, Writing tablet.....J. F. Malette  
Bismuth or antimony from their sulfid ores, Humid process of extracting the metals.....J. Randall  
Blanket retaining means, Animal.....F. H. Mitchell  
Bobbin holder.....C. A. Clark  
Bolt operating device, Automatic.....H. C. Stockwell  
Book leaves flexible, Rendering blank.....L. Clark  
Book, Scrap.....C. E. Schwartz  
Book binding.....C. E. Scarce  
Boot or shoe, Fastening for.....W. N. Button  
Boots, shoes, &c., Fastening for.....A. O. Carman et al  
Boring drill.....C. S. Stafford  
Bottle.....W. J. En Earl et al  
Bottle neck forming machine.....A. J. Rudolph  
Bottle washer.....C. H. Fischer et al  
Brake indicator.....W. D. Rogers  
Briquet.....C. F. Hood  
Brooch.....J. W. Simmonds  
Brow band attaching device.....C. Blume  
Brush.....F. G. Farham  
Buckle, Shaft and harness.....J. R. Boyd  
Button.....E. W. Silsby  
Button, Collar.....J. H. Finley  
Button, Collar.....W. A. Locke  
Button, Cuff.....C. H. Allen  
Button, Lapel.....M. R. Brueche  
Calcium carbid., Apparatus for treating.....J. von Oriowsky  
Calcium carbid holder.....E. L. White et al  
Camera, Kinetographic.....F. M. Lee et al  
Camera, Panoramic.....N. Thomas  
Camera registering mechanism.....A. W. McCurdy  
Can cleaning machine.....C. W. Sleeper  
Can opener.....A. T. Beckley  
Car brake.....J. H. K. McCullum  
Car coupling.....W. McBride  
Car coupling.....E. F. Pendexter  
Car coupling.....J. Timms  
Car door.....L. E. Hoerr  
Car, Motor.....W. Schen  
Car seat, Reversible.....W. L. Schellenbach  
Car seat, Walk over.....A. C. Deverell et al  
Car tippie for mines, Automatic.....C. H. Williams  
Car wheel, Railway hand.....W. J. Willits  
Cars, Electric lighting apparatus for railway.....E. J. Preston et al  
Cars, Electric lighting apparatus for railway.....W. F. Richards  
Carbon sheet holder.....I. MacFarland  
Carburetor.....E. A. McAllister  
Carbureting.....E. A. McAllister  
Carriage, Child's.....C. F. Dittmar  
Case for books &c.....C. A. Tucker  
Caster.....3 pats.....A. B. Diss  
Cattle guard.....R. V. Wallace  
Cattle to prevent fighting, butting &c., Device to be worn on the heads of hornless.....S. A. Smith  
Centerboard, Boat.....C. J. Smith  
Chain.....R. A. Carter  
Chain, Watch.....S. H. Warren  
Chair and tablet, Combined.....O. S. Jennings  
Chair.....B. Ringlesley  
Cigar branding machine.....N. Du Brul  
Cigar finishing and shaping machine.....P. Muhlbach  
Cigar or cigarette holder.....W. H. King  
Cigarette mouthpiece applying machine.....J. S. Beeman  
Clock case.....T. W. R. McCabe  
Clock frame.....J. G. Woodruff et al  
Clod crusher and pulverizer.....W. F. Shoup  
Closet seat.....B. Holz  
Cloth cutter.....A. G. Saberg et al  
Clutch, Friction.....A. de Dion et al  
Clutch, Friction.....J. Monkhous  
Cock, Conical water.....E. A. Pohlman  
Coin controlled apparatus.....U. Perrier  
Coin delivery device.....J. M. Butcher  
Coin detector.....T. I. Porter  
Cold storage apparatus or system.....A. J. Tibbitts  
Collapsible tube.....F. Stohr  
Combing machine.....A. Wenning et al  
Composition of matter.....W. Prampolini  
Concentrator.....J. Mauldin  
Confectionery display and dispensing case.....

F. L. Daggett  
Cooker, Feed.....F. Rippley  
Corkscrew register.....H. Maske  
Corn husker.....J. A. Ramsey  
Corset stay or stiffener.....J. P. F. White et al  
Cotton, Apparatus for unbalancing and blending raw.....S. Ecrody et al  
Cotton chopper.....D. C. Davis  
Cotton-gin, Roller.....J. E. Cheesman  
Cotton piece goods, Fixing the finish on.....M. S. Sharp  
Cream separator.....H. Whitlock  
Cultivator planting attachment.....S. W. Nelson  
Culvert.....M. C. Trumbull  
Current meter, Alternating.....W. H. Pratt  
Current motor, Alternating.....W. G. Rhodes  
Cut-off and light extinguishing apparatus, Time automatic.....H. L. Groome  
Cut-off, Automatic.....G. Christensen  
Cycle seat.....T. D. Wilgus  
Cyclometer.....L. J. Burdick  
Cyclometer or registering mechanism.....L. J. Burdick  
Dashboard, Hinged.....2 pats.....A. H. Alexander et al  
Defacing apparatus, Liquid.....E. W. Deming  
Delinting machine.....J. J. Faulkner  
Dental broach.....L. A. Young  
Dental separator.....E. Wishart  
Desk, School.....M. M. Holliman et al  
Detergent.....J. Pirard  
Dice.....V. Mapes  
Disinfectants to water closets, Float attachment for automatically feeding.....H. F. Jones  
Display rack.....H. M. Greener  
Door hanger.....L. A. Hoer  
Door, Sliding.....L. A. Hoer  
Drawing board rest.....H. W. Roberts  
Dredging machine.....L. C. Eisenhaut  
Dress shield fastener.....G. W. Ferguson  
Dry air chest.....G. R. Scates  
Drying apparatus.....C. Mallinson  
Dust collector.....2 pats.....J. E. Mitchell  
Educational appliance.....M. Thurston  
Electric circuit controller.....B. N. Jones  
Electric lighting, Producing incandescent materials suitable for.....G. Alefeld  
Electric meter.....L. C. Reed  
Electric metering system.....3 pats.....L. C. Reed  
Electric motor control.....W. R. Hamlien  
Electric motor control.....2 pats.....F. A. Merrick  
Electric motors, Apparatus for the control of.....W. R. Hamlen  
Electric motors, Starting asynchronous and synchronous monophasic.....E. Cantonio  
Electrically treating materials.....E. G. Acheson  
Electrode, Battery.....P. K. Irving  
Electrotypers furnace.....C. F. Jackson  
Enameling table.....B. A. Sievert  
Enameling table or machine.....E. C. Hoelscher et al  
End gate.....O. H. Wa kins  
Engine igniter, Explosive.....L. Jones Jr  
Engines, Automatic cut-off for.....J. B. Opsahl  
Engraving machine table.....N. Dedrick  
Engraving machine tool grinder.....N. Dedrick  
Evaporator.....A. P. Merrill  
Excavating machine.....J. H. W. Libbe  
Excavator, Self loading.....J. W. Weaver  
Eyeglasses.....F. M. Thompson  
Eyelet.....L. A. Roberts  
Fans, Hanger for electric ceiling.....W. H. Ayers et al  
Fancet, Measuring.....D. B. Jackson  
Fence post.....J. D. Paldi  
File, Newspaper.....J. Ahrends  
File, Newspaper.....B. R. Green  
Filter.....C. I. Simpson  
Filter.....J. F. Zeigler  
Firearm, Rapid fire breech loading.....J. J. Greenough  
Fire kindler.....L. Matthias  
Fireman's helmet.....2 pats.....W. C. Vajeau  
Fireman's mask.....W. Bader  
Flour bolt.....W. L. Burner  
Flour bolt brush operating mechanism.....W. L. Burner  
Folding machine.....O. Landry  
Foot power.....Z. McCune  
Friction drum.....C. Campbell  
Furnace.....W. C. Johnson  
Furnaces, Smoke consumer for steam boiler.....H. S. Bowler  
Gage.....W. E. Jones  
Galvanizing metals.....E. I. Bradcock  
Garment hanger.....W. F. Hall et al  
Garment supporter.....J. Sulzbacher  
Gas burner attachment.....T. J. Bush  
Gas engine.....A. Heil  
Gas generator.....J. E. Evans  
Gas generator, Acetylene.....W. Ross  
Gas meter.....T. H. J. Leckband  
Gas regulator.....S. L. McAdams  
Gas valve, Pressure.....C. A. Weber-Marti  
Gate.....W. Hatfield et al  
Gate.....A. Lindquist  
Gear cutting machine.....C. R. Gabriel  
Glass articles, Apparatus for producing hollow.....P. T. Sievert  
Glassware engraving machine.....G. Schiffbauer  
Glove, Washing.....D. Potter  
Grading machine, Road.....E. B. Kirkendall  
Grain cleaner.....S. H. Tromhauser  
Grain cleaner, Self leveling.....J. M. Lasswell  
Graphite, Manufacturing.....E. G. Acheson  
Grease cup or lubricator.....C. F. Kellom  
Grinding machine.....S. Brown  
Grinding machine.....F. Fancett  
Grinding mill feed mechanism, Roller.....A. H. Boelter  
Harness.....C. B. Olsen  
Harness breeching straps, Shaft attachment for.....C. E. Corlett  
Harvesting machine.....J. W. Hull  
Hat fastener.....F. W. Cammann  
Hat or cap rack.....E. J. Kirk  
Heating furnace.....S. T. Wellman et al  
Hinge, Spring.....J. Roche  
Hinge, Spring.....J. Jackson  
Hog scraping machine.....G. W. Constantine  
Hook and eye.....S. F. Sullivan  
Horse heel spreader.....J. McDonough  
Horseshoe, Cushion.....A. Simmons  
Horses, Protector against insects for.....C. Weller et al  
Hose coupling.....P. H. Reardon  
Hose supporter.....A. M. Erickson  
Ice cream, &c., Cutter gage for.....T. F. Crowley  
Injector, Steam.....3 pats.....F. Sticker  
Ink well.....E. Oldenbush  
Iron, Refining.....F. W. Hawkins  
Jar closure, Fruit.....A. Smelker  
Jar holder, Fruit.....L. E. Gower

Jewelry.....G. Lincks  
Jewelry fastening.....H. Conlan  
Kettle tipping handle and cover holder.....E. Morrison  
Kiln.....J. Lengsholz et al  
Kite.....E. B. Merriman et al  
Knapsack.....I. Weisenburger  
Knitting machine.....F. Rosati et al  
Lamp.....W. C. Homan  
Lamp burner.....W. E. Thompson  
Lamp, Electric arc.....W. Vogel  
Lamp, Gas.....M. P. Stevens  
Lamp globes, Manufacture of incandescent or other.....W. C. Fusner  
Lamp wick raising and controlling device.....F. B. Wailbel et al  
Lamps, Fastening device for heads of electric glow.....J. Kremenezky  
Lantern.....C. H. Koster  
Lathe.....J. F. Dowling  
Lathe turning attachment.....G. Reynolds  
Leaching vat, Bark.....J. B. Toms  
Leak stopper for vessels, External.....A. Colomes  
Leather, Coloring.....S. K. Felton Jr  
Leather dressing.....A. R. Dawley  
Leather treating.....R. B. Arthur  
Level.....J. W. Bechtel  
Level, Plumb.....B. C. Morgan  
Lighter, Pocket.....C. M. Campbell  
Linotype machine.....J. S. Thompson  
Linotype machine casting mechanism.....C. Hollwell  
Linotype machine quod forming attachment.....W. H. Doolittle  
Logging car.....G. A. Monntcastle  
Loom.....G. F. Hutchins  
Loom, protector mechanism.....F. A. Whitmore  
Lubricator.....F. H. Lunken  
Magnetic pad.....J. F. Strange  
Mail bag catcher and deliverer.....F. N. McDavitt et al  
Malt with coffee, Roasting.....F. Linde  
Mattress.....J. W. Case  
Mechanical driver.....I. M. Uppercn  
Mechanical driver.....J. K. E. Differderfer  
Mechanical movement.....C. R. Gabriel  
Mechanical movement.....A. Kresen et al  
Metal foil or leaf, Producing.....G. Alefeld  
Metal punching appliance.....F. McCarty  
Metals, Reducing easily oxidizable.....C. W. Miles  
Milk heating apparatus.....N. Ernst  
Milliner's box.....L. M. Sutton  
Milling angular toothed bevel wheels, Machine for.....E. Polanowski  
Milling cone screw wheels, Machine for.....E. Polanowski  
Miter box and calculator, Double.....P. F. McDonald  
Mitering machine.....C. Leisifer  
Moistening device.....S. W. Taylor  
Mowing machine.....H. L. Hopkins  
Music box, Electrical.....J. Natterer  
Music stand.....J. Latourell et al  
Nails, Apparatus for cement coating and packing.....I. Copeland  
Nest, Hen's.....S. A. Twyman  
Nut wrench.....W. S. Vankirk  
Office indicator.....C. V. B. Reeder  
Oil can.....J. K. Worrell  
Oil distributing means for oil engines, &c.....I. Charon et al  
Oven, Baker's.....T. Hitchen  
Package carrier safety lock.....E. C. Gipe  
Package handle.....H. H. Flanders  
Packing.....H. Boehling  
Packing case.....R. J. Prins  
Paper-board, Forming.....K. E. Rogers  
Paper feeding machine.....W. Bridgewater  
Paper hanging apparatus, Wall.....T. E. Moffitt  
Paper manufacture.....2 pats.....F. A. Fletcher  
Paper pulp dressing and evening device.....J. H. Mellor  
Paring and slicing knife.....J. W. Allen  
Peat burning apparatus.....G. Gercke  
Pencil, Lead.....A. B. Foster  
Pens, brushes, &c., Holder for.....A. Ogle  
Percolator for coffee or tea pots.....C. B. Tourville  
Photographic film.....O. Moh  
Photographic apparatus, Automatic.....J. Raders  
Pianoforte.....J. C. Ward  
Pilot burner, Automatic cut off.....J. P. Farmer  
Pipe moulding machine.....H. J. Taylor  
Plane, Bench.....J. A. Traut  
Pocket book.....J. Davidson  
Potato fork attachment.....R. M. Michael  
Printing press sheet perforator.....H. K. King  
Propeller, Steamship.....C. R. Enrich  
Provision box, Window.....H. G. Plumb  
Pulp, Machine for making vessels of fibrous.....A. Stark  
Pump, Boat.....M. M. Cullen  
Pump, Bucket chain.....C. Heffner  
Pyrotechnic gun, Rapid fire.....W. Teale  
Rail bond.....(Reissue).....C. J. Mayer  
Rail joint.....R. V. Wallace  
Rail-joint testing apparatus.....R. W. Conant  
Rail system, Electric third.....G. C. Hicks  
Railway construction.....H. B. Nichols  
Railway loop system, Street.....A. J. Trebbin  
Railway rail joint.....E. M. McVicker  
Railway tie.....H. W. Blauch  
Ratchet wrench.....C. Kingsley  
Reflector lamp.....G. Shannon  
Refrigerator.....H. B. Mordock  
Refuse burner or crematory for burning garbage.....J. Conley  
Register dial.....G. H. Alton  
Registering and recording machine, Weight.....P. C. Palmer  
Rein and whip holder, Combined.....J. E. Williams  
Remedial substances from swine blood, Preparing.....G. Lorenz  
Reveratory furnace.....H. Pahant  
Rock drill engine.....F. H. Reardon  
Rolling mill.....P. M. Weber  
Rolling mill.....S. T. Wellman et al  
Roofing.....J. T. Joslin  
Rope fastening device.....F. P. Howard  
Rotary engine.....E. J. Herchert  
Rotary engine.....R. G. V. Mytton  
Rotary engine.....M. J. Robinson  
Rotary Engine.....K. Thomann  
Sack tying machine.....J. W. Pedigo  
Safe, Screw door.....C. E. Blechschmidt  
Sash lock.....H. U. Frindle  
Sash lock.....U. Transne  
Saw filing machine.....O. C. Pendleton  
Scale dissolver and preventer.....H. C. Davis et al  
Scale, Pocket prescription.....R. W. Harmon  
Scraper, Road.....B. F. Stuart

Screen.....G. W. Cross  
Screws, Machine for manufacturing wood.....T. J. Sloan  
Seal lock.....L. A. Hoerr  
Sealed folding hollow body.....F. A. Walter  
Sealing newspapers, &c., Machine for.....C. V. Holland  
Secretary, Portable.....C. Goodwin  
Self playing instrument.....E. C. Hiscok  
Sewage to filter beds, Apparatus for applying.....F. A. Barbour  
Sewing machine.....W. Hlvakacek  
Sewing machine cabinet.....A. C. Ambramson et al  
Sewing machine thread waxing device.....W. K. Shultz  
Sewing machine tucking guide.....A. Laubscher  
Shirt.....E. G. Osgood  
Shoe.....H. W. Fowler  
Shoe fastening.....A. O. Carman et al  
Shoe fastening.....H. W. Fowler  
Shoe polishing device.....G. B. Dunn  
Shovel.....J. Colognati  
Sifting, scalping and grading machine.....W. L. Bruner  
Single trigger mechanism.....W. M. Levy  
Singletree and spreader, Combined.....R. F. King  
Siphon-elevator.....J. Lemichel  
Skate, Roller.....L. M. Richardson  
Sleigh knee.....K. Jones  
Snap switch.....G. W. Hart  
Soda, Apparatus for producing caustic.....H. S. Anderson  
Sound finder.....F. Burger et al  
Spark arrester.....J. R. Goodlier  
Spike machine.....G. E. Vandegrift  
Spindle band end holder.....W. H. Bracewell  
Stamp affixing machine.....W. R. Landfear  
Steam and destroying and utilizing garbage, &c., Apparatus for generating.....T. J. Robbins  
Steam boiler.....E. Humphrey  
Steam engine.....J. H. Fogarty  
Steam engine, Turbine.....J. Yongg  
Steam engine, Valve gear.....D. Valentine  
Steam generator.....E. T. Hannam et al  
Steam trap.....H. Helling  
Stitch machine, Fair.....E. F. Mower  
Stone, Composition for manufacturing artificial.....W. Heini et al  
Stopper fastening.....P. Devlin  
Stove burner, Gas.....H. Phinney  
Stove, Oil.....W. H. Wilder  
Street indicator, Electrical.....G. W. Stevenson  
Street sprinkler.....E. Balf  
Street sweeper.....F. D. Wright  
Tag assorting machine, Tobacco.....J. V. Bohannan  
Tag, Bicycle license.....J. E. Fisher  
Tank heater.....G. W. Boll et al  
Tape reel.....W. L. E. Kenffel  
Target, Traveling.....H. L. Moller  
Telephone exchange system and apparatus.....J. Z. Miller  
Thermometer, Oven.....R. L. Neurse  
Thread cutter.....J. W. Lane  
Threshing machine blower.....J. D. Diller  
Threshing machine brace.....W. Heidecker  
Tire, Cushion.....S. S. Miller  
Tire, Pneumatic.....H. Buchignani  
Tire tightener.....F. M. Marney  
Tire, Wheel.....W. Corliss  
Tires, Mold for vulcanizing.....F. H. Bolte  
Tires, Repair plug for pneumatic.....L. A. Carpenter  
Tobacco pipe.....T. G. Clifford  
Trace lock.....C. L. Kirscey et al  
Track gage.....J. D. Green  
Traction wheel for agricultural machines.....C. A. A. Rand  
Tramway, Cable.....W. Dusedan  
Treadle.....N. Du Brul  
Tree protector.....W. Watt  
Trimming making machine.....C. P. Schlegel  
Trolley.....T. Dennis  
Trolley head.....E. J. Rauch  
Truck, Collapsible.....C. T. Green et al  
Trunk fixture.....D. Goldsmith  
Truss, Hernial.....H. Becker  
Tube joint.....W. Hillman  
Tubing, Wire conduit.....C. D. Richmond  
Type setting machine.....P. H. McGrath  
Valve.....W. B. M. Bashline  
Valve.....F. F. Field  
Valve, Automatic stop.....I. Mayer et al  
Valve gear for explosive motors.....H. P. Maxim et al  
Valve, Steam engine.....A. Tandler  
Valve, Throttle.....G. H. Goodell et al  
Vanner.....H. T. Benson  
Varnish for drawings, Fixative.....L. Chialiva et al  
Vehicle body hanger.....H. C. Martell  
Vehicle, Motor.....H. Stommel  
Vehicle, Motor.....W. O. Worth  
Vehicle reach coupling.....D. J. Marston  
Vehicle seat, Supplemental.....N. Marsh  
Vehicle wheel brake.....G. N. Windle  
Velocipede.....T. Tolson  
Velocipede, Railway.....J. G. Matthews  
Wagon attachment.....H. M. Kelley  
Wagon box.....T. Forstner  
Wagon jack, Self locking.....O. Long  
Wagon, Speed.....B. S. Morden  
Walls, Apparatus for making plastic or concrete.....J. McNamee  
Warping machine creel.....C. Slingland et al  
Washing machine.....C. A. Dodge et al  
Washing machine.....A. J. Smith  
Washing machine.....J. S. Wilson  
Water closets or urinals, Silent flushing apparatus for.....J. Challenger  
Water, Purifying.....A. Shantz  
Water tank mould.....D. E. Forker  
Water tower, Portable.....H. E. Gorter  
Water wheel.....S. J. Tuthill  
Watering trough.....G. H. Mott  
Water proofing compo board, Means for.....W. H. Springer et al  
Welding, Electric.....R. P. Brown et al  
Window.....M. Haberie  
Window fastener.....A. T. B. Markham  
Window fastener, Storm.....J. H. Pease  
Window, Reversible.....H. K. Whitner  
Wine press.....W. H. Hommel  
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Woodworking machine.....L. Platt  
Woven fabric.....M. R. Hartz  
Wrench.....C. C. English  
Zinc reducing apparatus.....C. W. Miles

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Abrading machine.....E. J. Fletcher  
Abrading machine.....J. R. Thomas  
Abrasive tool.....G. Boxley



Advertisements. Stamping device for street... T. W. Wright  
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Air-brake coupling... 2 pats. A. R. Martin  
Animal-trap... J. Erickson  
Bag-holder... J. L. Herr  
Bag-holder for grain-weighing machines... J. C. Bissell  
Bail-guard or handle for pails or other receptacles... A. W. Ottiguen  
Bale detaching and staying device for presses... G. A. Lowry  
Bale-holding device... G. A. Lowry  
Ball and socket fastener... H. Kerngood  
Basin. Wash... W. Bunting, Jr  
Bath-tub... W. Bunting, Jr  
Battery cell. Storage... R. N. Chamberlain  
Bearing. Adjustable... A. Sidwell  
Bearing retainer. Ball, 4 pats... E. F. Creger  
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Bicycle handle bar... J. M. Blashfield  
Bicycle handle bar... W. R. Good  
Bicycles, &c. Knee-brace for... O. Kneusel  
Binder. Document... S. D. Baruet  
Boiler-brace... F. R. Sartor  
Boiler-cleaner... J. T. Norris et al  
Boiler-flue-retarding device... G. A. Nussbaum  
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Bottle. Non-refillable... J. Goodman  
Bottle. Non-refillable... J. A. Higgs  
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Buckle. Suspender... M. Rubin  
Budding-tool... J. Stelzl  
Bustle... H. H. Taylor  
Calk making machine... C. A. Filion  
Camera multiplying attachment... W. A. Peters  
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Canceling machine. Letter... F. C. Osborn  
Cane-cart loader... S. C. Herbert  
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Canvas, duck, or like woven fabric... S. M. Blumenfeld  
Car body-bolster... M. B. Schaffer  
Car controller. Electric railway... A. Sundh  
Car controlling apparatus. Electric A. Sundh  
Car coupling... J. McComb  
Car coupling... A. S. Ray  
Car coupling draft gear... J. Rawles  
Car. Dump... J. H. Gray  
Car. Dumping... W. A. Caswell  
Car. Dumping... G. H. Lawrence  
Car. Dumping... W. H. Onion  
Car platform. Railway... W. F. Richards  
Car-seat... G. Henderson  
Car-wheel-forging die... S. Clarke  
Car-window... W. E. Hendricks  
Cars. Train-controlling apparatus for electric... A. Sundh  
Carbon-sheet. Manifolding... E. S. Freese  
Carding engine flats. Apparatus for stripping... W. Rhodes  
Cartridge. Shot... H. J. Blanche  
Case or box... E. J. Fletcher  
Chuck. Drill... T. J. Kitto  
Closet-bowl... W. K. Johnson  
Clutch. Friction... C. W. Bogart  
Cock. Ball... V. J. Emery  
Coin-box... E. L. Thompson  
Compound engine... J. Watson  
Connecting device... J. R. Carter  
Coop. Poultry... C. N. Fisher  
Corn husking device... R. F. Clark  
Corn stubble cutter... J. H. Sharp  
Cotton, &c. Apparatus for compressing... G. A. Lowry  
Cotton, hay, &c. Apparatus for compressing... G. A. Lowry  
Cotton picker... L. Bilan  
Course-finding instrument for navigators... C. H. White  
Crushing machine... M. G. Bunnell  
Cultivator... I. D. Stockton  
Cupola... F. Hardert  
Current transformer. Continuous... A. Wyds et al  
Curtain support... L. F. Bergman  
Curtains, draperies, display-cards, &c. Telescopic supporter for... J. G. Birch  
Dental plugger... C. Schake, Jr.  
Detergent compound... A. Luhn  
Disinfecting device... L. F. Longmore  
Distilled water. Apparatus for producing... C. F. Conover  
Ditch or pit filling machine... W. G. Dunger  
Ditching or excavating machine... M. C. Mackey  
Door fastener... J. W. Dotson  
Door lock... C. B. Hand  
Dredging... F. M. Bell  
Drying kiln... H. J. Morton  
Dumb-waiter... C. W. Hoffman  
Dye and making same. Bluish-red... H. A. Bernthsen  
Dye. Black sulfur... C. Ris  
Electric circuits. Device for locating grounds on... M. J. Myers  
Electric light hanger... D. Brown  
Electric machine regulation. Dynamo... C. P. Steinmetz  
Electric meter... E. W. Rice, Jr.  
Electric energy. System of transmission of... N. Tesla  
Electrical transmission system... F. Bedell  
Electrically operated switch... E. M. Hewlett  
Electroplating... W. Y. Buck  
Electroplating. Holder for... W. Y. Buck  
Elevator controlling apparatus... J. J. Cook  
End gate rod and fixture... V. E. Simmons et al  
Energy. Distributing... G. Westinghouse  
Energy distributing apparatus... G. Westinghouse  
Engraving machine... W. S. Eaton  
Faucet... A. Sundh  
Faucet. Measuring... A. Sundh  
Feed water regulator... T. E. Bishop et al

Fifth wheel... A. E. Abbott  
Filter... G. L. Cummings  
Fire alarm apparatus... A. F. Doddridge  
Fire alarm. Automatic... C. Law  
Fire cracker body... G. Lisenard  
Fire escape... P. Grittinger  
Fire escape... C. H. Shields et al  
Fish cutting machine... J. M. K. Letson et al  
Flanging machine... J. S. Worth  
Flushing valve. Hydraulic... W. E. Hinsdale  
Fly trap... C. E. Varnum  
Folding machine... J. K. P. Pine  
Fracture apparatus... C. Boegle  
Fruit juices. Device for extracting... C. W. Taylor  
Furnace grate... R. S. Mayer  
Fuse. Blasting... J. A. Fusner  
Galvanic element. Dry... W. Botz  
Game device... 3 pats. A. Kuch  
Garment. Union... J. M. Tauner et al  
Garter fastener... E. W. Puellmann  
Gas generating and storing apparatus... W. Blackie  
Gas generator. Acetylene... J. E. Eris et al  
Gas generator. Acetylene... E. Yvonneau  
Gas generator oil-sprayer... J. P. Johnson et al  
Gas producer... J. W. Gaynor  
Gas producer. Automatic... C. W. Bildt  
Gate... J. M. Adams  
Gate... J. Tennant  
Gearing. Motor... E. A. Sperry  
Glass articles. Apparatus for manufacturing hollow... W. Buttler  
Glass beveling apparatus... W. O. Bailey  
Glassware. Apparatus for making... W. Buttler  
Gold saving device... A. M. Lyon  
Grain elevator... H. Eielson  
Grain vessel. Hopper bottom... L. Hohmann  
Grate bar... J. Fisher  
Grease. Refining distilled... J. Hopkinson  
Guns. Ejector for breakdown... F. A. Foster  
Hammock... R. S. Graham  
Hand and arm. Artificial... H. Schenck  
Harrow... A. Anderson  
Harrow. Disk... A. Lindgren  
Hat clearing machine... L. R. Heim  
Hat ironing machine... L. R. Heim  
Heating and ventilating system... W. H. Hormel  
Heating apparatus and device for controlling action thereof. Steam... E. F. Osborne  
Heating systems. Temperature regulating apparatus for steam... C. E. Van Auker  
High potential apparatus... E. Thomson  
Horse-power. Hay press... C. F. Kohlruess  
Horse shoe... E. Tuchler  
Horse shoe calk... J. W. Miller  
Horse shoe ice-creeper attachment... J. M. Myers  
Hose coupling... E. J. Hannold  
Hose patch... D. H. Bennett  
Inhaler... W. W. Winton  
Injecting powders into the nasal passages. Device for... C. H. Murphy  
Inkstand. Combination... W. T. Fitzpatrick  
Insulation for railways. Electric... J. E. Wright  
Insulator and switch therefor. Section... G. R. Mair  
Invoice sheet... C. Lohrmann  
Ironing webbing. Machine for... L. A. Gale  
Jack block... J. F. Reed et al  
Jail... R. C. Stewart, Jr et al  
Jewelry fastening... C. E. Smith  
Jewelry mounting... A. A. Boismann  
Knitting machine... J. E. Tuttle  
Knitting machine. Circular... H. A. Houseman  
Knitting machine. Circular... F. Wilcomb  
Ladder. Step... J. G. Milhine  
Lamp. Acetylene... A. C. Einsten et al  
Lamp chimney... J. F. McHenry  
Lamp. Electric arc... E. L. Bowen  
Last. Divided... B. Arnold  
Leather polishing machine... F. Breidenbach  
Leather polishing machine... W. H. Downs  
Leather stretching machine... F. H. Adams  
Lettering guide... W. J. Hannegau  
Lock... W. H. Taylor  
Lock and latch... W. H. Taylor  
Locomotive. Mine haulage... C. E. Drvis  
Locomotive tender coal-gate... J. N. Cntler  
Loom... C. Alvord  
Loom... H. W. Clay  
Loom indicator mechanism... H. Hardwick  
Loom indicator mechanism... C. Alvord  
Loom shuttle... Z. Thuot  
Loom warp stop motion... A. W. Clement  
Loom web replenishing machine... A. D. Emery  
Low water alarm... W. D. McLaughlin  
Mail bag... A. W. Frank  
Marker. Land... L. A. Arlaud  
Measuring device. Cloth... O. E. Webber  
Measuring instrument... E. L. Giles  
Measuring instrument. Distance... J. G. Hanks  
Mechanical apparatus. Controlling device for... A. Sundh  
Mechanical movement... J. W. Martin  
Mercerizing, &c. Apparatus for... L. Weldon  
Micrometer gage... F. Spandling  
Milk modifying apparatus... E. Strans  
Mine signal... J. B. Falkenstein  
Minerals or buried treasures. Locating metallic... F. H. Brown  
Mining apparatus... J. A. Laycock  
Mining machines. Device for moving... S. F. Lechner  
Necktie holder... W. L. Barth  
Nut lock... F. W. McFarland  
Ores. Apparatus for oxidizing or roasting refractory... R. A. Stewart  
Oven. Bake... E. T. Wildsmith  
Packing... J. J. Moss  
Paper making. Apparatus for separating and cleaning pulp for... reissue. F. C. Michaelis  
Pencil... S. Grim  
Phonograph records. Reproducing... T. B. Lambert  
Piling... W. B. Bonnell et al  
Pipe union... S. Richardson  
Planer attachment... F. Diehl  
Planing machine... J. R. Thomas et al  
Planter. Corn... W. S. Graham  
Plow... F. Keller et al  
Plow land-wheel attachment... S. Sully  
Plow scraper attachment... G. A. Litzenger  
Pocket knife... M. L. Heath  
Pocket. Safety... L. Almuly  
Poke. Animal... W. B. Hart  
Press feeding device... W. M. Holmes  
Press feeding device... W. M. Holmes et al  
Press feeding device... 3 pats. G. A. Lowry et al  
Press for cotton, wool, hair, &c... 2 patents. G. A. Lowry  
Press hopper... J. A. Butler  
Presses. Combined hopper and feeder for...

Printing bar... G. A. Lowry et al  
Propeller. Boat... E. V. Beals  
Propeller. Screw... H. D. Guffer  
Propeller. Screw... A. B. Koserot  
Propeller. Screw... W. E. Pugsley  
Pulley. Well... J. Foster  
Pumping apparatus and compressor... L. M. G. Delaunay-Belleville  
Punch. Belt... F. L. Harmon  
Radiator... O. E. Wait  
Radiator support... F. H. Patrick  
Rail joint... C. R. Brent  
Railway. Electric... 2 pats. E. C. Morgan  
Railway rail joint... S. M. Hopping  
Railway signal... C. A. Stimpson  
Railway signal. Automatic... H. L. Seib  
Railway switch. Street... D. F. Gilchrist  
Railway switches. Auxiliary lock for... P. R. Walsh  
Railway third or traction rail. Electric... W. A. P. Willard, Jr  
Railway tie plate... E. M. Smith  
Railways. Combined sleeper and conduit for electric... W. Courtenay  
Range. Cooking... S. A. Wilde  
Razor guard... T. F. Curley  
Reamer and drill. Combined... N. B. Spencer  
Receptacle or can... J. T. Mills  
Refrigerating and ventilating car. Combined... J. Player  
Reversible seat... W. L. Schellenbach  
Rotary motor... J. B. Sample  
Saddle... E. E. Mallory et al  
Saddle or seat... R. Platz et al  
Saddletree... G. Loeloff  
Safety pin... C. A. Bryant  
Safety pin... H. H. Taylor  
Sash cord fastener... M. W. Neuens  
Sawing machine... C. E. Sandstrom  
Scaffold... A. N. Helstrom  
Screw... J. N. Bowman et al  
Seals for bottles, jars, &c. Lock... W. T. Kosinski  
Seeding machine... A. C. Lewis  
Sewer purifying apparatus... J. E. Lewis  
Sewing and plaiting machine... O. M. Chamberlain  
Sewing machine... J. W. Eshelman, Jr  
Sewing machine. Buttonhole... A. H. Armen  
Sewing machine. Chain-stitch... A. Rontke  
Sewing machine feeding mechanism... P. Diehl  
Sewing machine hemmer... E. B. Allen  
Sewing machine. Overseaming... H. A. Klemm  
Sewing machines. Guiding or pile-controlling device for... E. B. Allen  
Shipping case... J. W. Preater  
Sign. Illuminated... G. J. Ferguson  
Snow melting machine... C. E. Gettier et al  
Spectacle case and pencil holder. Combined... E. M. Johnson  
Spectacle and eyeglass mounting... M. C. Thomas  
Spinning apparatus... G. O. Draper  
Spinning mule. Self acting... J. Pickford  
Stacker. Straw... F. Feldmann  
Stamp. Dating... H. L. Brotherton et al  
Steam engine... C. S. Dean  
Sterilized perishable substances. Receptacle for... I. L. Roberts  
Still. Mineral oil... F. Berg  
Stocking supporter... J. A. Hudson  
Storage battery... P. Kennedy  
Stovepipe thimble... B. F. Logan  
Stoves, ranges, &c. Fire box for... H. J. Warren  
Strap covering machine... L. A. Gale  
Switch controlling device. Electric... E. W. Hammer  
Tag making and stringing machine... W. S. McKinney  
Telephone appliance... C. E. Scribner  
Telephone call register... W. Gray  
Telephone exchange apparatus... C. E. Scribner  
Telephone trunk lines. Automatic calling appliance for... C. E. Scribner  
Telescope. Coin operated... O. Weise  
Tent. Umbrella... D. Downs  
Thill coupling... W. F. Schubert  
Tile... F. Furness  
Tile. Building... J. B. Seager  
Tire. Vehicle... C. T. Adams  
Tobacco-leaf-sorting apparatus... B. O. Dahl  
Toe. Box... G. L. Preble  
Tool handle... E. Manes  
Toy... T. Holmes  
Toy... C. W. Taylor  
Traction engine... C. L. Schultz et al  
Tread. Step... A. Bischoff  
Tree or shrub protector... J. A. Conrad  
Tree protector... H. H. Belknap  
Truck for locomotives. Swing... K. Rushton  
Truss. Hernial... P. Madden  
Turning machine. Wood... H. Mayers  
Type. Apparatus for justifying set... H. J. S. Gilbert-Singer et al  
Valve... J. C. Fox  
Valve. Air... S. P. Watt  
Valve. Blow-off... C. H. Topp  
Valve for sinks or stationary washstands... H. C. G. Kasschan  
Valve motion. Engine... E. E. Clark  
Valve. Pressure relief... W. M. Holmes  
Vaporizer... O. A. Johnson  
Vehicle brake... P. D. Blackder  
Vehicle brake... L. L. Pletcher  
Vehicle brake. Motor... E. A. Sperry  
Vehicle cover... F. H. Wolfgang  
Vehicle leveling attachment... J. Nash  
Vehicle seat... J. Burns  
Vehicle spring wheel... 3 pats. J. L. Ancelle  
Velocipede... T. Tolson  
Veneer machine... W. H. Williams  
Wagon bodies, &c. Apparatus for lifting... W. F. Stout  
Wagon. Weighing... L. D. Norris  
Waistband. Apparel... L. Zazeela  
Waist holder and skirt supporter. Combined... G. L. Blackman  
Washboard... R. E. Leve  
Washing machine... C. W. Thompson  
Watch regulator... E. Avila  
Water distributing system... A. D. Strong  
Watering fountain. Poultry... A. H. Chapman  
Weighing machine... F. F. Meyer  
Whist apparatus. Duplicate... W. E. Watkins  
Window bracket... J. W. Gibson et al  
Wire stretcher... J. H. Fellows  
Wood carvings. Making pressed... P. Wedekind  
Wood preserving apparatus... C. J. Doyle  
Wort from malt flour. Producing... C. Schmitz  
Wrench... H. B. Hartford

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Accountment supports... J. D. ...  
Air compressor... 2 pats. J. D. McKinnon  
Air motor. Compressed... B. P. ...  
Alcoholic liquids. Purification... M. J. de Chantrel et al  
Alkali sulfates. Apparatus for decomposing... J. G. A. ...  
Alloys. Making... G. H. Clamer et al  
Ammeter... P. H. F. ...  
Ash ejector... C. W. ...  
Back pedaling brake... 3 pats. A. P. ...  
Back pedaling brake... M. R. Schaefer et al  
Bag making and filling machine... W. H. Butler et al  
Bale band tightener... L. V. ...  
Baling press... E. M. ...  
Baling press. Boiler... E. I. ...  
Bark rolling apparatus... L. Wertheim  
Basket weaving machine... E. L. Walker  
Battery jar or receptacle... E. A. Scerry  
Beam covering... C. T. Parry  
Bearing... G. H. Clamer et al  
Beer &c. Apparatus for cooling and dispensing... W. Bachner  
Bell... A. Arers  
Bell. Electric... F. Keller et al  
Bicycle... E. H. Fisher  
Bicycle frame... N. E. ...  
Bicycle hand power... J. D. ...  
Bicycle rack... W. H. ...  
Bicycle saddle... W. Bailey  
Bill of fare indicator... F. A. Herzer  
Binder frame... H. P. Jones  
Boats. Apparatus for hoisting or lowering ships... J. H. Kiencke  
Boiler... R. Bohnen  
Book for typewriters. Blank... W. F. Dodsworth  
Book case &c... I. E. Rockwell et al  
Bottle. Non-refillable... C. B. Overbaugh  
Bottle sprinkler... H. O. Brawner  
Box... F. S. MacDonald  
Brake shoe... J. F. Morrison et al  
Brick handling apparatus... J. P. B. Fiske  
Bricks or the like. Machinery for pressing... R. T. Hughes  
Brickmaker's housing... W. N. Cary  
Bridge gate. Draw... H. W. Yerrington  
Broom handle... J. W. Willard  
Brooms &c. Holder for... C. W. Gaston  
Brush-mat quilter... D. Neale  
Burner... W. Ege  
Burners. Soot-dispersing attachment for... J. C. ...  
Button... F. G. ...  
Button... E. W. ...  
Button fastener... E. B. Wersel Jr  
Button setting machine... E. B. White  
Button. Sleeve... J. E. ...  
Cabinet. Kitchen... E. Wheeler  
Canister for packing edibles... W. J. Harries  
Car bottom... E. W. Summers  
Car coupling... A. O. Arnold  
Car coupling... G. Hermanson  
Car coupling... W. F. Johnson  
Car coupling. Automatic... 2 pats. ...  
Car fender... Reissue... R. ...  
Car. Metallic... E. W. Summers  
Car or engine wheels. Machine for grinding... W. P. Leshure  
Cars. Automatic air coupling for... J. W. ...  
Carburetor... J. R. ...  
Card separating device... E. E. ...  
Cards. Playing... J. F. ...  
Carriage. Child's... G. E. O'Hearn  
Cart. Bag carrying... J. B. Rhodes  
Caster socket... H. D. Reed  
Cellulose solution for manufacturing threads... E. Bronner  
Chain. Transmission... P. Hoevel  
Chair adjustment... J. Karpfen  
Chair attachment. Infant's... W. E. Thompson  
Check hook and harness hanger. Combined... J. G. ...  
Chimney. Metal... P. Dickinson  
Chisel. Turner's... L. Berger  
Churn... J. A. Parker  
Churn-dasher... A. Hazleton  
Cigar bunching machine... J. H. ...  
Cigar wrapper cutting machine... N. D. ...  
Clamp for textile fabrics... C. L. ...  
Cloth cutter... R. J. ...  
Clutch mechanism... A. P. ...  
Coat lock... D. E. ...  
Coin controlled apparatus... R. W. ...  
Collar... W. F. ...  
Colter. Plow... W. S. ...  
Coop. Folding fowl... A. W. ...  
Coop. Poultry... J. A. ...  
Copyholder... G. M. ...  
Core bar coating machine... M. H. ...  
Corn crib... C. I. ...  
Cornice. Box... C. M. ...  
Corset. Apparel... C. Julien-Binard  
Corset. Apparel... E. M. ...  
Cot. hammock, or stretcher... E. S. ...  
Cotton chopper... J. J. ...  
Cotton compress. Roller... L. Raborn  
Cotton feeders. Valve gear for pneumatic... G. W. ...  
Cotton gin flue system... T. C. ...  
Coupling... J. Darling et al  
Crate for fragile boxes... L. L. ...  
Creamer. Centrifugal... J. Laidlaw et al  
Crusher and pulverizer... 2 pats. M. F. ...  
Crushers and pulverizers. Hammer support for... E. H. ...  
Cuff holder... C. E. ...  
Current wheel... J. Winter et al  
Curtain ring... W. F. ...  
Cycles. Acetylene motor for... C. H. ...  
Dehorning or branding chute... W. S. ...  
Designs. Producing colored... G. ...  
Desk. Hotel register... G. P. ...  
Devulcanizing apparatus... A. H. ...  
Dish drainer... M. L. ...  
Display apparatus... T. ...  
Display cabinet... J. L. ...  
Door button. Sliding... D. ...  
Door check and closer... G. G. ...  
Door lock. Sliding... A. Newell  
Door opener. Automatic... J. ...  
Door spring... F. ...  
Dowel. Wooden... J. ...  
Drawers. Lady's... J. ...  
Drying room... J. H. ...  
Dust collector and separator... A. W. ...  
Dyeing fabrics... G. ...  
Dynamoes. Automatic regulator for altering...



- Easel support.....G. S. Neeley  
 Electric coupling.....G. A. Peterson  
 Electric machine, Dynamo.....G. Dalen et al  
 Electric machine, Dynamo.....B. G. Lamme  
 Electric motor.....H. F. Joel  
 Electric switch.....J. L. Creveling  
 Electrical connection device.....M. Pfatischer  
 Electrical connections, Protecting.....J. Langton  
 Electrical connector.....J. Langton  
 Electrical switch.....J. C. Tournier  
 Electrolytic apparatus.....L. H. A. B. M. Hazard-Flamand  
 Elevator.....E. M. Fraser  
 Elevator.....J. D. Griffen  
 Elevator.....C. A. Harkness  
 Ellipsograph.....E. Tintanne  
 Engine.....N. J. Verret  
 Engines, Electromotors, &c. Apparatus for electrically controlling.....W. H. Harfield  
 Engraving machine diamond holder, Pantograph.....J. Hope et al  
 Envelop.....T. W. T. Maxwell  
 Explosive engine.....J. F. T. Durvea  
 Explosive engine.....C. Sintz  
 Fan, Ventilating.....H. Kiem  
 Fastener setting machine gage attachment.....G. W. Brown  
 Fancet, Beer.....L. E. Mitchell et al  
 Feeder for steam boilers, Automatic.....E. J. Strong  
 Feeding device, Boiler.....F. J. Weiss  
 Feeding device for boilers, Safety.....E. J. Weiss  
 Fence machine, Wire.....M. D. Taylor  
 File, Letter.....H. S. Culver  
 File, Newspaper.....F. C. Blaisdell  
 Filing box cabinet.....R. W. Pope  
 Filing case, Card.....F. W. Tobey  
 Fire escape.....H. Sperling  
 Fire escape ladder.....T. F. Krueger  
 Fire proofing wood.....H. V. Simpson  
 Fishing reel.....W. W. Trabe  
 Floor cloth, Machine for cutting tesserae for.....E. Batten  
 Fluid interchanging device.....H. Szamatolski  
 Fluid pressure engine.....H. B. Goodhart  
 Fluid pressure regulator.....R. N. Baylis  
 Fly escape.....V. D. Muzzy  
 Folder.....G. P. Fenner  
 Folding table, Adjustable.....H. Mehserie  
 Fur cutting machine.....J. Derbohlaw  
 Furnaces, Mechanism for throwing sprays of oil into.....T. B. Browne  
 Game.....M. J. Hotelling  
 Game, Ball and target.....W. R. Park  
 Garbage receptacle.....W. Bachner  
 Gas burner.....J. F. Barker  
 Gas burner.....J. P. Farmer  
 Gas burner, Incandescent.....A. H. Peterreit  
 Gas generating apparatus, Acetylene.....E. Evans  
 Gas generator, Acetylene.....R. L. Beck  
 Gas generator, Acetylene, H. P. Leftwitch et al  
 Gas generator, Acetylene.....J. H. Ross  
 Gas generator, Acetylene.....C. E. Yvonnean  
 Gas generators, Valve for water.....H. Strache  
 Gas igniting pill.....A. Martini  
 Gas, Manufacture of.....E. De Fazi  
 Gathering-iron, 2 pats.....D. F. Richardson  
 Glass articles, Apparatus for manufacturing hollow.....P. T. Sievert  
 Glass, Treating woven wire in manufacturing wire.....J. W. Sheppard  
 Gold and silver ores &c. Treatment of.....J. C. Montgomerie et al  
 Gold ores, Treating.....C. Wetherwax  
 Golf club.....J. Cran  
 Golf club.....J. Dalgleish  
 Governor, 3 pats.....F. M. Rites  
 Grain binder.....A. G. McIntosh  
 Grain conveyor belts and means for operating same, Concentrating-rolls for.....S. F. Evans  
 Grave concealing apparatus.....G. J. Chaffee  
 Grinding machine.....J. S. Bancroft et al  
 Gun, Automatic magazine.....M. Beck et al  
 Harvester attachment, Corn.....J. P. Degnan  
 Harvester, Corn.....W. Howard  
 Harvesting machine, Beet.....J. I. Jackson et al  
 Hay carrier.....J. H. Burkholder  
 Heel breasting machine.....A. G. Brewer  
 Hoof pad.....W. J. Kent  
 Hoof trimmer.....E. Morgan  
 Horse foot covering.....M. Hallanan  
 Horse shoe and pad.....M. Hallanan  
 Horseshoe, Cushioned, 2 pats.....T. J. Lovett  
 Horseshoe, Rubber cushion.....H. Paar  
 Horseshoe, Soft tread.....M. Long  
 Hose pipe.....M. H. Hart  
 Hub attaching device.....J. A. Weitzel et al  
 Hydrocarbon burner, 2 pats.....M. O. Godding  
 Hydrocarbon motor.....E. T. Headech  
 Incandescent mantles, Compound for coating.....A. S. Newby  
 Induction motor.....G. S. Neeley  
 Injector.....C. S. Taylor  
 Ink for marking cigars or tobacco.....E. Klein  
 Ink well.....S. G. Baldwin  
 Ink well and reservoir, Combined.....J. H. Miller  
 Inner soles, Machine for applying stiffening pins to.....J. V. Allen  
 Kite.....W. A. Eddy  
 Knitting machine.....L. N. D. Williams  
 Ladder, Folding.....T. H. Bettv  
 Lamp, Acetylene gas, 2 pats.....W. C. Homan  
 Lamp, Blow pipe.....J. Heinz  
 Lamp bracket.....F. Rhinds  
 Lamp, Flash.....C. Klary  
 Lamp, Portable electric.....A. F. Vetter  
 Lamp, Vapor burning incandescent.....A. P. Doran  
 Lamps, Device for convenient filing of.....L. Pagal  
 Lantern latch.....E. B. Snow  
 Last.....E. W. Gerrish  
 Lathe for turning crank shafts.....J. Moll  
 Ledgers &c. Extensible post for transfer.....H. P. Jones et al  
 Letter or order box.....P. A. Bradford  
 Leveling instrument.....M. Nilson  
 Library, pool and billiard table.....S. W. Collins  
 Lifting jack.....A. J. F. Miller  
 Lime, Apparatus for making bisulfite of.....V. Drewson  
 Lining hoops, Machine for attaching.....M. J. Bartlett  
 Linotype machine.....E. G. Leonard  
 Lock and latch, Combined.....L. H. Mullikin  
 Locomotive windows, Folding shield or guard for.....H. M. Pemberton  
 Loom shuttle.....D. M. Seaton  
 Lubricator.....J. F. Lewis  
 Lubricator.....E. McCoy  
 Machine cover, Adjustable.....W. B. Leonard  
 Match-box.....J. Ashton  
 Match-box.....J. Schiffereder  
 Mattress-filling frame.....N. L. Johnson  
 Mattress-filling machine.....C. W. White  
 Medicinal products, Making.....H. Opperman  
 Metal shears.....J. C. Burgess  
 Metal sheet, Apparatus for picking or cleaning.....S. Diescher  
 Milk cooler.....J. J. McAreavy  
 Milking apparatus.....W. H. Lawrence et al  
 Milling and fulling machine.....E. Gessner, Jr  
 Miter-box.....S. Levan  
 Mold-making machine, Sand.....W. Murchey  
 Molds, Means for filling.....P. Wernicke  
 Mortising and boring machine, Combined.....G. W. Meserve  
 Motion mechanism, Step-by-step.....R. Hundhausen  
 Motorcycle, Hand-power.....F. X. Golata  
 Motor.....H. T. Vaders  
 Mower, Lawn.....W. F. Hall  
 Nippers, Cutting.....R. H. Love  
 Nippers for closing metallic rings upon rubber tubing.....W. Dewar  
 Non-conducting covering.....J. Jones  
 Noodle-cutter.....A. V. Lacombe  
 Numbering machine, Consecutive.....O. G. Bartusch  
 Nut-lock.....H. Klemm  
 Nut-lock.....J. W. Stanley  
 Nut-lock.....J. W. Wilson et al  
 Ordnance, Apparatus for mechanically loading.....J. Krone  
 Ore-concentrator.....W. E. Wild  
 Ore or rock breaking machine.....E. Comerford  
 Organ, Reed or pipe.....M. S. Wright  
 Pail, Self heating dinner.....H. L. Marlett et al  
 Pail, Ventilated.....W. T. Follweiler  
 Paper bag.....O. G. Goodman  
 Paper boxes, Machine for making.....W. Gay  
 Pen, Fountain.....W. I. Ferris  
 Pen, Fountain.....B. B. Goldsmith  
 Pen, Fountain.....W. E. McKee  
 Penholder.....B. B. Goldsmith  
 Pessary.....H. A. Hempel  
 Pew.....W. H. Kratz  
 Phonograph.....P. von Wouwermans  
 Photographic-print fabric.....J. A. Harvey  
 Picking and cleaning machine.....C. W. White  
 Pile.....G. D. Coleman  
 Pipe connections from leaking, Apparatus for preventing.....W. J. Sterling  
 Plane, Wood.....H. M. Coe  
 Planter attachment, Corn.....F. R. Eral  
 Planter check-row attachment, Corn.....M. B. Bennett  
 Planter, Corn.....P. W. Thompson  
 Planter lister attachment.....J. L. Pate  
 Playing-ball.....A. R. Breinl  
 Plow attachment.....C. Wilson  
 Plow-jointer.....C. Wilson  
 Plow-jointer.....G. W. Ream  
 Plow, Rotary.....M. T. Hancock  
 Plow seeding attachment, Gang.....A. J. Malsbary  
 Pneumatic separator.....C. H. Lane  
 Potato-pumping apparatus.....F. Malinsky et al  
 Primary battery.....F. B. Badt  
 Printing, associating, and folding machine, Web.....R. C. Annand  
 Projectiles, Metallic compound for.....G. Roth et al  
 Projection apparatus.....J. J. Frawley  
 Propelling apparatus, Hydraulic.....F. W. Simmons  
 Prospecting-dish.....W. G. Collins  
 Pruning implement.....D. S. Donzella  
 Pulp articles, Manufacture of.....W. W. McEwan  
 Pump-rod spring attachment.....J. O. Bane  
 Pumping-engine.....G. W. McGill  
 Rail-joint.....M. V. Gipson  
 Railway-rails, &c. Apparatus for recording flexure of.....J. E. Colas  
 Railway surface-contact system, Electric.....R. Lundell  
 Railway-switch.....I. Robbins  
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 Razor-strop, Duplex.....J. H. Hemmerdinger  
 Reflector.....O. Hillstrom  
 Refrigerator.....R. Frey  
 Refrigerator drip-cup attachment.....C. G. Spalding  
 Refuse-constructor.....H. P. Boulnois et al  
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 Robe for invalids, Bed.....M. E. Sims  
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 Roentgen-ray apparatus.....J. M. Davidson  
 Roof-ventilator or chimney-cowl.....R. M. Pancost  
 Rope-thimble.....K. A. Hammond  
 Rotary engine.....L. J. B. Le Rond  
 Rotary engine.....W. T. Mooney  
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 Rule, Perforating.....J. A. Lofstedt  
 Safety-pin.....M. V. Thorndike  
 Sash-balance.....H. P. Cayce  
 Sash-balance.....W. J. Parsons  
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 Saw.....D. Phillips  
 Saw.....D. Phillips  
 Saw and adjustable square, Combined.....J. E. Spatz  
 Saw, Metal-cutting.....J. Hilton  
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 Scaffold, Window.....W. Holtzapfel  
 Scale-pan.....W. G. Mizel  
 Secondary battery.....H. Blumenberg, Jr, et al  
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 Sewing machine cabinet.....F. Patzack  
 Sewing machine guide.....C. W. Dodge  
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 Shearing-tool.....J. K. Stewart  
 Shears.....J. T. Schnorr  
 Shirt, Apparel.....W. R. Chaplin Jr  
 Shovel and sifter, Combined.....W. P. Hyrons  
 Shredding and pulverizing machine, Centrifugal.....F. Andree  
 Sickle-bar.....W. H. Brusman et al  
 Sieve or bolting machine, Gyration.....C. H. Loutzenhiser  
 Sign.....F. Tuchfarber  
 Siphon.....S. H. Adams  
 Snap switch.....G. W. Hart  
 Soap, Making.....J. Stockhausen  
 Sole rough rounding and channeling machine.....J. E. Bertrand  
 Sound reproducer.....F. W. Nolte  
 Space and lead-discarder and distributor-loader.....P. F. Cox  
 Specific gravity apparatus.....G. Himmel  
 Spinning machine top-roll saddle and stirrup therefor.....J. Bilsborough  
 Spokes to rims of wheels, Device for fastening.....R. Muller  
 Spool-rack, Ribbon.....H. B. Moore  
 Sprinkling-stopper.....F. W. Cook, Jr  
 Stacker, Hay.....A. Buchey  
 Stamp, Automatic time.....N. H. Suren  
 Stamp, Rotary marking.....H. E. White  
 Starching machine.....W. A. Newton  
 Steam engine.....J. T. Rossiter  
 Steam generator.....W. H. Harrison  
 Steam or other elastic-fluid engine.....J. H. Street  
 Steam-press, Rotary.....M. J. Fisher  
 Stoker, Mechanical draft and underfeed.....R. M. McBeth  
 Stove heating attachment.....R. S. Stephensen  
 Stove, Hydrocarbon burning.....F. P. Glazier  
 Stovepipe elbow making machine.....A. N. Fairman  
 Sugar juice heating apparatus.....L. Hirt  
 Swinging gate.....J. E. Gibbs  
 Switch operating device.....F. Wright  
 Telephone.....M. Beck et al  
 Telephone and vending machine, Combined.....C. H. Kraft  
 Telephone receiver.....A. K. Keller  
 Telephone system.....A. K. Keller  
 Telephone system, Duplex multiple metallic.....F. C. Hughes  
 Telephone transmitter.....A. K. Keller  
 Thermal testing tube.....J. L. Hollingsworth  
 Thermostat.....C. B. Rogers  
 Thill reinforce.....A. G. Brunsmann  
 Threshing machine.....A. E. Price  
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 Tile and means for securing same in place.....H. Hubert  
 Time alarm, Electric.....H. Reich  
 Tire, Cushion.....W. G. Kendall  
 Tire, Pneumatic wheel.....W. Corliss  
 Tire, Vehicle.....H. S. Firestone  
 Tire, Wheel.....W. Corliss  
 Tires, Means for repairing pneumatic.....H. S. Van der Siemple  
 Tobacco curing and ordering apparatus.....J. L. Hollingsworth  
 Tool, Combination.....P. H. Walsh  
 Tool holder.....L. T. Parsons  
 Toy.....C. M. A. Wichmann  
 Toy, Mechanical.....T. W. Klipfel  
 Trace-eye guard.....W. P. Murphy  
 Track sanding device.....F. E. Allen  
 Track sweeper.....F. D. Branch  
 Tree support.....J. Donnelly  
 Trolley wheel.....R. S. Windsor  
 Trunk.....S. B. Smith  
 Trunk fastening or lock.....A. R. Colburn  
 Trunk tray.....S. B. Smith  
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 Twyer for forge furnaces.....J. Easte et al  
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 Valve, Blow off, 2 pats.....F. M. Faber  
 Valve, Engine.....J. H. Moore  
 Valve for water feed pipes, Safety.....N. Lombard  
 Valve operating device.....J. W. Gayner  
 Vehicle.....R. H. Elrod  
 Vehicle brake.....H. G. Simmons  
 Vehicle draft apparatus.....W. G. Davis  
 Vehicle gearing, Motor.....E. A. Sperry  
 Vehicle running gear.....A. P. Robinson  
 Vehicle spring draft device.....H. J. Ashley  
 Vehicle wheel.....A. Palm  
 Vehicle wheel, Road.....J. Liversidge  
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 Velocipede pedal driving gear.....C. I. Faulkner  
 Vending machine.....G. F. Brown  
 Veneer coiling and nailing machine.....G. A. Gage  
 Vessel hulls, Machine for cleaning.....T. W. G. Cook et al  
 Vessel indicator.....A. L. McCormick  
 Vessel, Navigable.....H. L. J. C. Thrc  
 Vessels, Auxiliary motor for.....R. T. Power  
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 Water gage.....J. A. Fletcher et al  
 Water, Purifying.....J. MacDougall  
 Water purifying apparatus.....C. L. Kennicott  
 Wave motor.....J. C. Walker  
 Wheel.....G. H. Crosby  
 Wheels, Machine for making metal.....E. Einfeldt  
 Winding machine yarn clearer.....E. Einfeldt  
 Window screen.....H. M. Girdwood  
 Wire fabric.....J. W. Sheppard  
 Woven fabric.....M. Koec  
 Wrapper or envelop.....J. Gearing  
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- Abrading cylinder.....J. R. Thomas  
 Acid and making same, Naphthazarin sulfo.....R. Bohn  
 Acid, Phenol ether of quinin carbonic.....A. Weller  
 Adding machine.....G. W. Chapin  
 Adhesives, Making.....C. Brueder  
 Adjustable table.....H. F. Finnegan et al  
 Advertising device.....A. Heiron et al  
 Air box, Self cleaning fresh.....G. Cody  
 Air brake.....C. E. Morgan  
 Air or other liquid gases, Portable vessel or bottle for holding and shipping liquid.....F. Place  
 Alarm handle.....C. W. Mettler et al  
 Alloy of aluminium and magnesium.....L. Mach  
 Ammunition, Feed strip for fixed.....L. V. Benet  
 Annunciator and spring jack.....W. D. Gharky  
 Annunciator and spring jack, Combined.....E. E. Clement  
 Apron, Apparel.....W. M. Memminger  
 Atomizer spray tube.....H. M. Dunlap  
 Auger, Well.....J. Hahn  
 Automobile steering gear.....W. L. Crouch  
 Awning operating mechanism.....W. Johnson  
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- Bails to sheet metal vessels, Attaching wire.....G. W. Knapp  
 Bait or spinner, Spoon.....E. F. Pfeuger  
 Bale of cotton, &c.....P. K. Dederick  
 Baling press.....P. K. Dederick  
 Bath cabinet.....A. C. Floyd  
 Bath cabinet, Hot air or vapor.....J. H. Lennon  
 Battery elements, Cellulose envelop for storage.....E. A. Sperry  
 Bearing, Thrust.....H. Wyss  
 Bearings, valves, &c. Material for.....J. Kitsee  
 Bed bottom, Spring.....J. F. Gail  
 Bed slat.....C. V. Lively  
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 Bicycle attachment.....C. H. Bemenderfer  
 Bicycle brake.....M. Fesler  
 Bicycle brake.....J. C. Hauger  
 Bicycle saddle.....P. W. Pratt  
 Bicycle saddle.....G. A. Rost  
 Bicycle wheel.....C. O. Stehfest  
 Bill carrying apparatus, Mechanical.....A. W. Thierkoff  
 Binder, Wire.....G. D. Foster  
 Blind and brace connector.....E. R. Gambell  
 Bobbin holder.....T. J. Mordock  
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 Boiler tube stopper.....C. S. Clark  
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 Boot or shoe patterns, Machine for outlining and grading.....L. Cote et al  
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 Bottle neck forming machine.....A. J. Rudolph  
 Bottle neck forming tool, 2 pats.....P. Lindemeyer  
 Bottle neck forming tool.....H. R. Loper  
 Bottle necks, &c. Tool for forming 2 pats.....P. Lindemeyer  
 Bottle stopper.....J. S. Alston  
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 Branch or lamp switch.....E. Liebscher  
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 Building construction for floors and ceilings.....T. O'Shea  
 Bunsen burner.....C. M. Kemp  
 Burglar alarm.....A. S. Gensfer  
 Burning coal dust, Apparatus for, reissue.....G. Hilliger  
 Button.....A. L. Sprague  
 Button cleaning device.....H. A. Deiters  
 Button drilling machine.....S. P. MacCordy  
 Button fastening device.....W. A. DeLong, Jr  
 Button, Separable.....D. J. Sinclair  
 Cabinet, Spool.....W. H. Guntner  
 Caddie bag.....H. H. Perkes  
 Cake pan.....W. B. Mumford  
 Calendar.....M. O'Marra  
 Camera, Magazine.....R. W. Balch et al  
 Can capping machine.....C. W. Sleeper  
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 Cane, stripper and cleaner.....J. B. House  
 Car brake.....C. V. Rote  
 Car controller, Electric railway.....A. Sundh  
 Car-controlling apparatus, Electric railway.....A. Sundh  
 Car door, Freight.....L. H. Harrison  
 Car, Freight.....W. T. Manning  
 Car label holder, Railway.....T. W. Geary  
 Cars or vessels, Cooling and ventilating attachment for.....G. A. Dunn et al  
 Carbon brush.....E. Thomson  
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 Cellulose, Producing solutions of.....E. Bronnert  
 Chuck, Tool.....J. L. Cook  
 Churn.....K. W. Hargrove  
 Chute, Coal.....J. W. Cocherell  
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 Circuit protective device.....W. D. Gharky  
 Clamp.....T. Dickman  
 Clasp.....M. Rubin  
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 Coating applying apparatus.....W. L. Allen  
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Pull or handle.....J. H. Gavin  
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Stove pipe coupling.....A. A. Armitage  
Stovepipe fastener.....D. W. Smith  
Strainer.....L. Shutte  
Strainer. Milk.....E. S. Lagerquist  
Strainer. Milk pail.....M. S. Field  
Strap holder.....J. V. Washburne  
Street sweeper.....H. W. Libby  
Sulphonates. Making.....A. Verley  
Surf motor.....S. H. Emmens  
Swing. Convertible.....W. Bulmann  
Switch.....D. Kerekes  
Table adjuster.....W. H. Wyatt  
Tack puller.....J. H. Driller  
Tag shipping.....J. M. Crocker  
Teaching the elements of geography. Apparatus for.....V. T. Murche  
Teeth. Device for regulating.....W. P. Sugatt  
Telephone exchange system.....6 pats.....E. E. Clement  
Telephone exchange system.....E. E. Clement  
Telephone exchange system.....2 pats.....W. D. Gharky et al  
Telephone switchboard. Plug seat for.....A. K. Keller  
Telephone system.....W. D. Gharky  
Telephone system and apparatus. Intercommunicating.....W. D. Gharky  
Telephone transmitter.....E. E. Clement  
Telephones. Instrument for measured-service.....C. E. Gierding  
Temperature regulator.....T. O. Perry  
Tent and cape. Combined shelter.....L. Fisher  
Thill coupling.....C. C. Bradley  
Thill coupling.....A. McAvoy  
Thill coupling.....A. Schubert  
Thill coupling.....A. H. Worrest  
Thresher stacker fan.....W. N. Rumley  
Threshing machine.....B. Jackie  
Threshold.....G. A. Seely  
Tile.....H. F. Webb  
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Tool. Machine for actuating reciprocating.....J. W. Stowe  
Tooth. Artificial.....H. R. Nehrbass  
Tooth. Artificial.....T. Steele  
Toy ball.....D. C. Alden  
Toy. Detonating.....C. F. Graber et al  
Trestle. Knockdown.....B. E. Cronkrite  
Trolley.....W. B. Potter  
Trouser hanger. Elastic.....W. B. Tyler  
Truck. Car.....S. W. McMunn  
Truss.....I. E. Johnson  
Truss. Hernial.....A. Bedson  
Type tray.....J. Grant  
Umbrella. Folding.....D. Carpenter  
Vacuum tube light.....D. M. Moore  
Valve and pump. Automatic steam.....T. B. Browne  
Valve for fluid pressure brake systems. Engineers.....N. A. Christensen  
Valve gear cut-off.....R. Hardie  
Valve. Pressure reducing.....R. Hardie  
Valve. Reversing.....J. Keller  
Valve wheel.....J. P. Lewis  
Vehicle.....A. Smithson et al  
Vehicle brake.....J. Ferrel  
Vehicle driving mechanism.....E. Childs  
Vehicle wheel.....J. Bell  
Vehicle wheel.....R. Mulholland  
Vending machine.....W. M. Mack  
Vessel.....W. B. Motheral  
Wagon box.....E. W. Fonda  
Wagon brake.....J. F. Hart  
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Water purifier.....P. Schreck  
Water purifying apparatus.....J. B. Greer  
Water purifying apparatus.....J. MacDougal  
Water resisting products from casein. Manufacturing.....W. Krische et al  
Water supplying and heating apparatus.....A. G. Mather  
Water wheel.....J. E. Symons  
Watering apparatus. Stock.....H. F. Barber  
Weighing machine. Cost indicating, registering, and weight-totating apparatus for.....W. H. Gundry et al  
Well tool. Oil.....C. R. Fisk  
Well.....W. R. Arnold  
Wharf construction.....H. C. Holmes  
Whiffletree attachment.....E. F. Baerle  
Wire connector.....A. Gartner  
Wire stretcher.....J. C. Baker  
Wire tightener.....J. S. Hansford  
Wires connecting.....H. R. Lamb et al  
Wires. Die for joining intersecting.....H. R. Lamb et al  
Wires. Means for connecting.....H. R. Lamb et al  
Wood bending machine.....A. B. Keyes  
Wood drying apparatus.....A. Lambiotte  
Wrist band and cuff holder. Combined.....W. H. McDonald  
Yeast and making same.....A. J. Priest

## RECENTLY PATENTED INVENTIONS.

(Continued from Third Page.)

Franklin J. Engel and Christ F. Hirth, Mayville, Wis. Game Apparatus.—This is a novel parlor game designed to represent base ball. It comprises a base board laid off as a base ball ground and has unique mechanism for delivering the ball to an automatic batter. The position to which the ball is driven determines the position of the runner. It makes a very interesting and exciting game.

Randolph N. Martz, Frederick, Md. Picket Fastener for Wire Fences.—By this construction, the pickets are securely fastened to the line wires without the liability of their splitting or becoming broken. It consists of wire fasteners which pass through holes in the center of the picket, the fasteners being bent around the line wires at those points and having the ends passing around the picket and coiled about the line wires. This is an improvement that will be greatly appreciated.

Josiah G., and Martha S. Phenix, Hoodsport, Wash. Steam Cooker.—The invention comprises a receptacle provided at one end with a water reservoir and having interior ledges which support skeleton trays. These trays hold perforated cooking vessels within which the articles of food are placed. An automatic whistle notifies the attendant when the water supply should be replenished. The device is exceedingly simple, convenient, and efficient, and different articles of food can be thoroughly cooked without the odor of one contaminating the other.

Martin L. Rison, Paris, Tennessee. Spring Broom-Handle.—The handle is fastened to the head of the broom by means of a coiled spring which is secured by novel means. This makes a flexible joint whereby the operator is relieved from the strain incident to the use of a stiff handle, and the construction being inexpensive, the broom made in this manner become a household necessity. It may also be applied to other analogous articles with equal advantage.

Martin L. Rison, Paris, Tennessee. Spring Chair Seat.—While this device is especially designed for chair seats, it may be used in a great many other ways. It comprises a series of conical helical springs radiating from a common center and attached to an outer frame. A spring reinforcing device is arranged underneath to relieve the springs from the strain. This device distributes the weight and retains its shape after continued use, and forms a very comfortable chair seat or back.

George W. Sanor, Pacific, Missouri. Folding Bed.—This invention comprises a combined bed and dresser. It consists of a case provided with a mirror and adapted to receive the bed which slides therein in a verticle position. The lower end forms a dresser and is provided with the usual series of drawers and receptacles. The construction is simple and efficient and possesses many advantages over the ordinary folding bed, and at the same time it is very ornamental.

John A. and Aaron M. Scheyhing, Eaton, Ohio. Wire Fence Machine.—This machine is intended for service in the field for the fabrication of a wire fence, and provides means operated from a single driving shaft for twisting the wool wires around the longitudinal warp wires, separating the same to form the mesh, and propelling mechanism which is automatically and intermittently operated, whereby the machine is moved bodily along the proper distance at the required time. This machine, besides being a great labor saver, is comparatively inexpensive, and as efficient as those of a more costly character.

Canadian Patents may now be obtained by the inventors for any of the inventions named in the foregoing list, provided they are simple, at a cost of \$30 each. If complicated the cost will be a little more. For full instructions address E. G. Siggers, 918 F Street, N. W. Washington, D. C. Other foreign patents may also be obtained.



### THE SERVICE BUILDING.

The Service Building of the Pan American Exposition, to be held at Buffalo, New York, on the Niagara Frontier, from May 1st to November 1st, 1901, was the first building of the Exposition to be erected and is used by the corps of officials and employees having direct charge of the constructive work of the Exposition.

The building, which is situated on the west side of the grounds, is 95 x 145 ft. It is in the form of a hollow square, having two stories on its exterior facades and three stories on the court side. The entrance, which is in the form of a driveway, faces the north and communicates directly with the inner court. Part way down this entrance, and from each side, extend the main corridors. That on the right leads to offices and apartments to be used for police headquarters and hospital service, including the rooms for the use of the Commandant of Police, Police Station, the Chief of the Fire Department, medical waiting-room,

are the sleeping apartments of the Director of Works and the chiefs of the various bureaus, comprising the Department of Works. Here also are numerous apartments for such of the employees as the nature of their duties requires to be continuously at the Exposition grounds. A kitchen and dining room, apartments for the janitor and hospital nurses, and several guest chambers are provided on this floor.

The top floor of the building has additional apartments, a large blue printing room for the use of the Architects and Engineers Departments, and the operating rooms for the official photographer of the Exposition.

The building has a cellar. Frame construction has been used throughout. The studs are covered on the inside with composition board and sheathed on the outside with hemlock planks, which are covered with cement plaster, the final finish having the appearance of stucco.

The ornamental work, including the flag standards, finials, festoons, etc., are of staff. The roof is covered

the border of the grounds. Some ten thousand cubic yards of top soil have been scraped, piled, mixed, and turned over. Four thousand yards of excavation have been removed from the East Lake; two greenhouses 20 x 80 x 10, with propagating houses adjoining have been built, and a number of cold frames have been set out.

The grounds have been cross-sectioned; building canals, and roads have been staked out. 13,000 feet of sewer have been constructed. Route for intramural railway has been surveyed, and from 4,000 to 5,000 feet of canal, which encircles the grounds, have been excavated.

Two thousand large poplar trees and maples have been received and prepared for early planting in the Spring. Two hundred and fifty Monumental cedars have been prepared, boxed and are now awaiting Spring before being shipped from New Jersey.

Plans have been completed for the foundations of the Agricultural Building, and complete plans for Machinery

49 pounds potash, 3 pounds of soda, 13 pounds of lime, 5 pounds of magnesia, 5 pounds of sulphuric acid, and 6 pounds of chlorin. The amount of nitrogen, phosphoric acid, and potash in the stalks was greater after curing than at the time of cutting.

Analyses of stalks of different varieties of tobacco made by the Virginia Station show that, on an average, the stalks of air-dried plants contained 3.71 per cent of nitrogen, 0.646 per cent of phosphoric acid, 5.02 per cent of potash, and 2.22 per cent of lime. The stalk is considered as constituting a little less than one-fourth of the average plant. At the Kentucky Station, soil which had received an application of 4,000 pounds of tobacco stems per acre yielded at the rate of 80.1 bushels of ear corn and 6,270 pounds of fodder per acre as compared with a yield of 57.6 bushels of ear corn and 3,940 pounds of fodder on soil which had received no fertilizer. Tobacco stems were the most effective fertilizer in a series of fertilizer experiments with corn. It is stated, however, that it is not known whether the plots on which this test was made had been fertilized alike prior to the time this experiment was undertaken.—From report of the U. S. Department of Agriculture.

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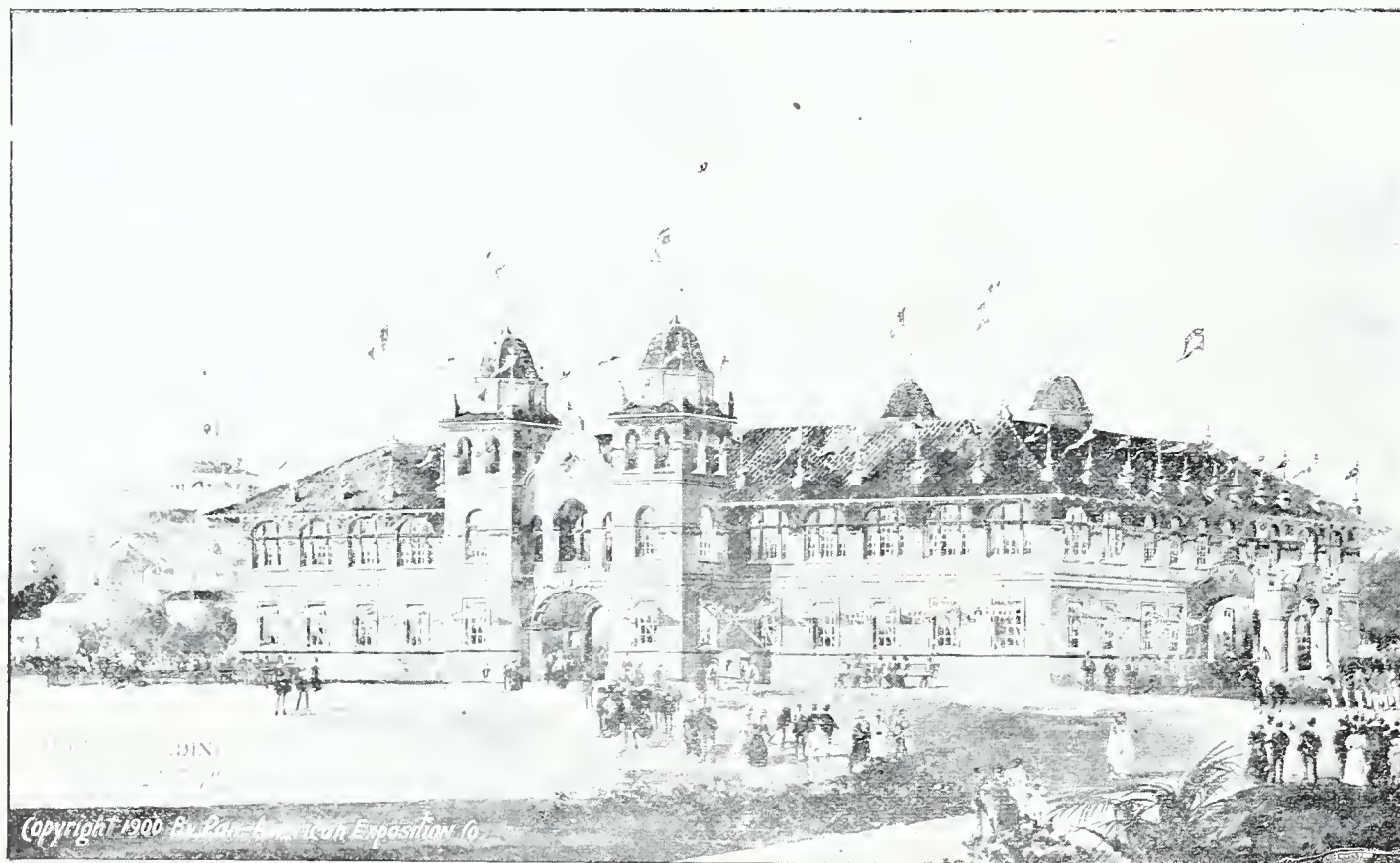
### PATENTS

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(19 Years Personal Experience.)  
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### PATENTS



drug supplies, offices for a surgeon and his assistants, and an operating room. The hospital has a porte cochere entrance for ambulance and emergency purposes.

The other portions of the first floor are taken up by a large room for the officers and clerks who have charge of the admissions and collections, and the auditing of accounts; these rooms being fitted with fire-proof vaults.

The working offices of the Director of Works, with his private office and stenographer's room, offices for the Landscape Architect, the Superintendent of Building Construction, Purchasing Agent, Chief Engineer, Mechanical and Electrical Engineer, and accommodations for the officers having charge of Transportation and Installation, Exhibits and Concessions are arranged to carry on the business of these departments.

On the second floor is the large draughting room used by the force of architectural draughtsmen. This department has separate offices and draughting rooms, with a large vault for valuable drawings. On this floor

with Spanish tile of iron. The building in its architecture is a free adaptation of the Spanish Renaissance, such as is shown in old Californian and Mexican missions and churches. This style was followed as closely as the requirements and exigencies of arrangement for light and space, necessary in a first class working office, allowed.

The building was erected ready for occupancy in thirty-two working days.

#### PROGRESS OF THE WORK ON THE EXPOSITION GROUNDS TO JANUARY 20, 1900.

Work was begun on the site September 26th. Since that date the land has been cleared of fences, and twenty-four hundred small poplar trees, twelve hundred willow bushes and seven hundred assorted shrubs have been planted about the grounds. A boundary fence has been built eight feet high and twelve hundred feet long. A nursery has been prepared and several thousand trees and shrubs have been planted therein. Seventy-five large trees have been transplanted from points in the site to avenues on

and Transportation, one of the large buildings—350x500. Bids for all the main buildings will be invited at an early date, and even before Spring of this year much progress in the constructive work will have been made.

#### Tobacco Stalks and Stems as Fertilizers.

Since the stalks of tobacco and the stems of the leaves constitute a large part of the crop, which is usually not removed from the farm, the amount of plant food they contain becomes an item of considerable importance. Analyses of tobacco stems, when cut and after curing, were made by the Connecticut State Station in 1891. From the data obtained, the plant food taken from the soil by the stalks while growing, and returned to it when plowed under, is determined. It was found that the stalks on an acre of tobacco containing 8,000 plants weigh about 9,500 pounds at the time of cutting, and 3,300 pounds when they have been cured. The average results show that these stalks contain 32 pounds of nitrogen, 8 pounds of phosphoric acid,



## RECENT PATENTS.

### Electric Light Shade.

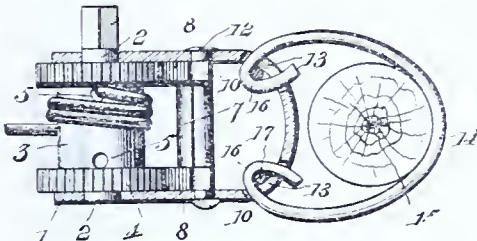
A very useful novelty and much needed article is the lamp shade recently patented by Mr. Walton Duane Smith, of Prophetstown, Illinois, who has assigned a one-half interest to Mr. William McNeill. The device, as shown in the accompanying illustration, is particularly adapted for incandescent electric lights, and the construction is such that the shade may be adjusted to different elevations with respect to the light. Means are also provided whereby the insulation on the wire conductor is protected from injury. By this device the volume of light may be regulated as desired, an advantage that will be highly appreciated. Furthermore, the device is inexpensive and is within the reach of all.



Mr. Smith is a very ingenious and prolific inventor and has a number of patents on different devices. The noteworthy feature of all his inventions, is that they are for useful and desirable articles. They always show deep study and work in simplifying and bringing them to a high state of perfection before being placed before the public.

### Fence Wire Tightener.

The accompanying illustration gives a very good idea of an excellent wire tightener recently patented by Mr. Peter Frantz, of Sterling, Ill. The device comprises a U-shaped frame in

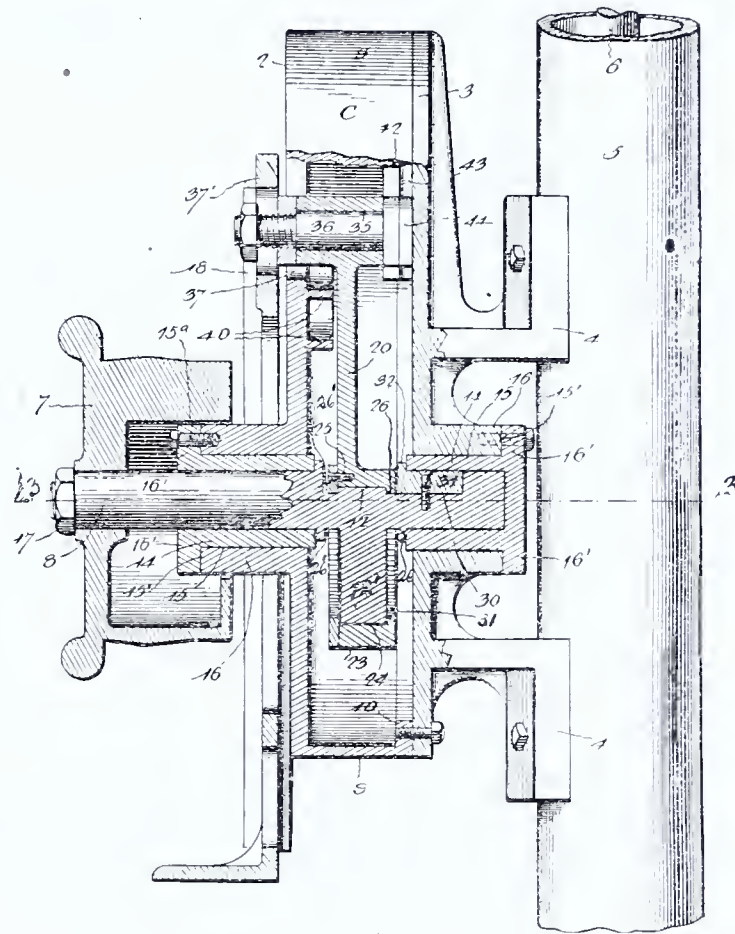


which is journaled a windlass that is provided with an annular series of ratchet teeth. These ratchet teeth are engaged by an eccentrically mounted pawl whereby the windlass is securely locked against backward rotation. A loop is attached to the frame and surrounds the post whereby the necessity of boring holes through the post and weakening it is overcome. The construction affords a simple and reliable device that can be placed in a variety of positions and will not be affected by rust or exposure to the weather.

### Dabbing Brush Apparatus.

A new dabbing brush apparatus for wool-combing machines will be of interest to those skilled in this art. It is the invention of Mr. Isaac Rushworth, of Jamestown, N. Y., and is an improvement on a previous patent to the same inventor. In the class of machines to which this invention relates, the stock or wool is beaten by quick blows of a vertically reciprocating "dabbing brush," upon circular combs, so arranged that the wool being pressed upon the adjacent parts of the combs, is drawn out or carded by the separation of the parts as the combs revolve. The device, as shown in the accompanying illustration, is of an exceedingly simple nature, and at

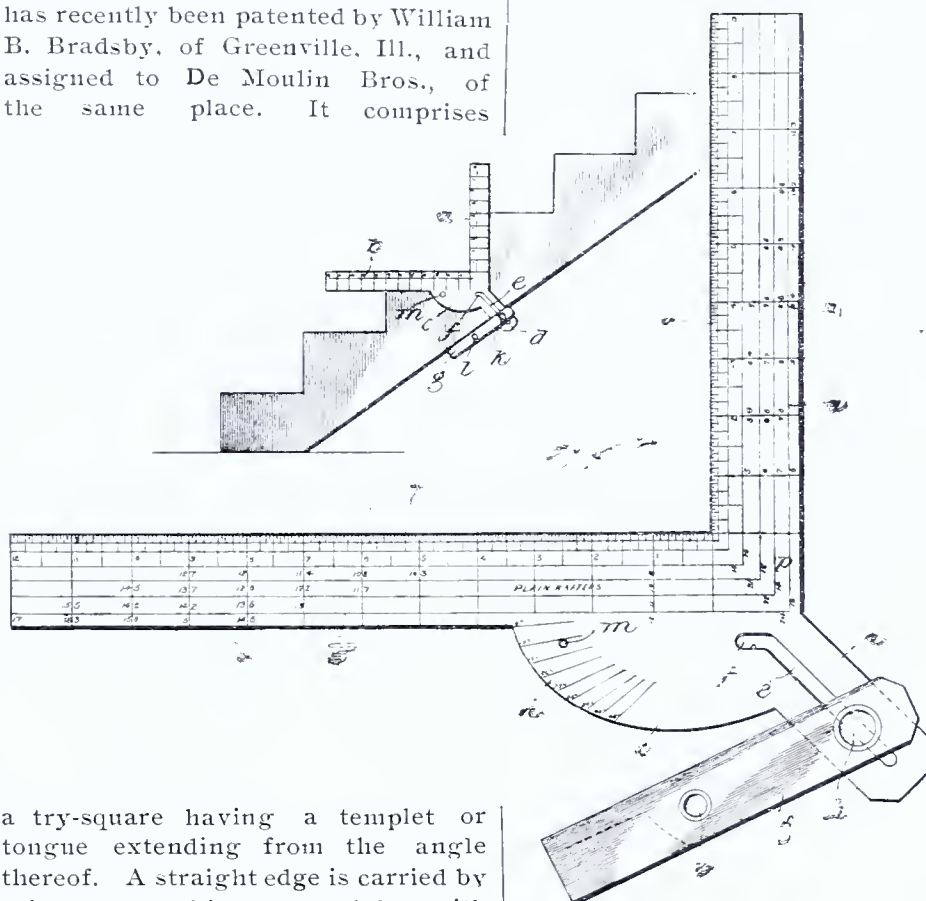
the same time is a great improvement over others now in use. The mechanism is completely housed within a casing whereby it is protected, and at the



same time the lubricating oil is prevented from splashing. The driving mechanism comprises a pulley 7, which receives power from any suitable source. The pulley is fast upon a shaft 8, which carries an eccentric 12, that is connected by means of an arm 20, to a reciprocating bar 37. The lower end of this bar carries the brush. It will thus be seen that the device is of a durable construction and meets every requirement.

### Measuring Instrument For Carpenters.

An instrument that will commend itself to stairbuilders and carpenters has recently been patented by William B. Bradsby, of Greenville, Ill., and assigned to De Moulin Bros., of the same place. It comprises



a try-square having a templet or tongue extending from the angle thereof. A straight edge is carried by this tongue and is connected therewith by a thumb screw which fits in a slot in the tongue. By this construction, a simple device is provided whereby the terminal cuts of rafters and other timbers, and also cuts of stair-horses

and wall strings may be laid off, the blades of the try-square being provided with graduations whereby the lengths of rafters and similar timbers may be

ascertained, when the angle of the pitch or the "rise" and "run" are known.

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FOR SALE.—Patent No. 640,193; improvement in child's carriage. A device which enables the turning of corners without lifting either the front or rear wheels off the ground; can be applied to any style of carriage. Address John K. Gerrick, Hanover, Pa.

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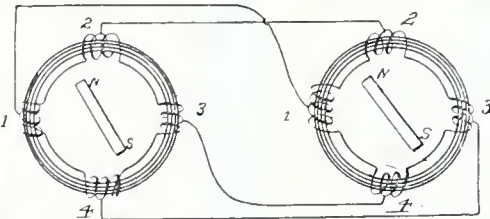
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It follows that the Board is one of considerable power, and its members are skilled in the law and in all the manifold details of the Divisions of the Office. Since it was constituted in 1861, nearly all its members have been promoted to places on it after years of

experience as Examiners, and have brought to their aid the resources of minds trained in the bewildering details of the multiplied inventions of modern times. They are required by law to be men of competent legal knowledge and high scientific ability.

An appeal to the Examiners-in-Chief from an adverse decision of an Examiner upon a matter of substance can

be taken only after an original or amended claim in the application has been twice rejected by the examiner, and after all the claims have been passed upon and all questions of form conclusively settled. This appeal is instituted by a written petition, signed by the applicant or his authorized attorney, setting forth the points of the decision from which the appeal is taken and reciting the reasons for the

form, the appellant may amend it, or may appeal from this finding to the Commissioner as upon any other question of form. The appellant, previous to the day of hearing before the Examiners-in-Chief, usually files a brief of the authorities and arguments on which he will rely to maintain his appeal; and if he wishes to be heard orally, he must indicate it at the time of filing his petition, when a day of

appeal orally before the Board, which has before it the entire record in the case, comprising not only the application itself and the official actions thereon, but also sometimes whole books, models, drawings, and sketches. A full docket for an afternoon consists of six cases and requires a really wonderful range of acquirements and information to deal with it justly. For instance, the first of

the six cases may involve an abstruse question of chemical reaction, the second may be one of hydraulics, the third may require acquaintance with all the infinite variations of children's toys, the fourth may involve the little understood question of electrical force, and the fifth may be a demand for the re-issue of a patent turning, as such cases usually do, on some hair-splitting legal point. The ability to switch the mind rapidly from one subject to another, no matter how different, and to understand all the minute technical claims advanced by attorneys who have studied the cases for days, and to be able to refuse claims which to the average man would seem perfectly good, calls for a high order of ability and uncommon skill and knowledge. It must be remembered, that in the very nature of the case, each claim must be a new ap-



THE BOARD OF EXAMINERS-IN-CHIEF.

appeal. The petition, having been duly filed, is submitted to the Examiner, who, if he finds it to be regular in form, must thereupon furnish to the Examiners-in-Chief, a written statement of the grounds of his decision on all the points involved in the appeal, with copies of the rejected claims and the references applicable thereto. If he finds the petition irregular in

hearing will be fixed and proper notice given him; otherwise the case will be considered and decided by the Examiners-in-chief upon the brief presented.

The Board hears appeals on every afternoon of the week except Saturday, granting half an hour to ordinary cases. The applicant appears by his attorney and argues the ap-

plication of principles and consequently cannot be settled according to precedents.

The Examiners-in-Chief can affirm or reverse the decision of the Examiners only upon the points on which the appeal is taken; but if they discover any apparent grounds, not involved in the appeal, for granting or refusing letters-patent in the form





JUDGE S. W. STOCKING.

claimed, or in any other form, they must annex to their decision a written statement of these grounds, with such recommendations to the Examiner in regard to his future action as they may deem proper. These new grounds must then be considered by the Examiner; and from his adverse decision, upon any question of substance therein presented, another appeal lies to the Examiners-in-Chief, or on questions of form to the Commissioner, as in other cases. As a general thing, attorneys consider that the Board is more liberal in its decisions than are some of the primary Examiners. For instance, in a recent case, where the Primary Examiner refused to allow a single one of five claims advanced, the Board not only allowed all of them but suggested one more that might be made.

The average time required by the Board to render judgement on a case is about three weeks, though occasionally, in cases of great importance, it takes many months. Very rarely an immediate decision is rendered, and this is only in cases so simple and plain that they should really never have been appealed at all. Three weeks is the average and it speaks well for the industry of the Board that it is not longer. Even with every morning and all day Saturday to consider its decisions, it is surprising that it should be able to get through so much work.



JUDGE J. H. BRICKENSTEIN.

During the hearing the Board usually questions the attorney more or less. Afterwards, the case is talked over by the three members and a conclusion reached. It is then assigned to one or the other of the three members for a written opinion.

The cases which ordinarily give the Board the most trouble are "interference" and "reissue" cases. "Interference" cases are those where two or more parties claim the same invention. These parties may be two applicants, or an applicant and a former patentee. These are first heard by another division, presided over by the Examiner of Interferences, and go on appeal from him to the Board of Examiners-in-Chief. Usually, a good deal of money is involved in these cases and great care is therefore necessary in deciding them. "Reissue" cases are where a patentee finds that he has not made his claims properly, and that his patent is more or less defective or inoperative. He then comes and surrenders his patent and asks that it be re-issued in proper shape with proper claims broad enough to



JUDGE THOS. G. STEWARD.

make it of some value to him. Such cases usually arise through some reckless attorney "railroading" the case through the Office without proper examination. Such action pleases the applicant at first because he gets a patent quickly, but he finds later that his patent is valueless and that to make anything out of it he has to do the whole thing over. Claims for re-issue are difficult to obtain, as details of patent law are involved and usually it turns out that some abstruse principle obstructs the desired action.

S. W. Stocking, Chairman of the Board, is a graduate of Hamilton College, and a member of the bar of the State of New York. He served in the Union Army through the war, was appointed to the Patent Office as third Assistant Examiner in 1873, was promoted to Principal Examiner in 1876, and to Examiner-in-Chief in 1889.

J. H. Brickenstein, the second member of the Board was graduated from Princeton College in 1885, taking the degree of Master of Science and entered the Patent Office as a fourth Assistant Examiner in 1885. He was employed in the Metallurgical and Electrical Divisions, and after having been promoted through the intermedi-

ate grades was appointed a Principal Examiner in 1893 and assigned to Division VII. In 1895, he was appointed to his present position. He is a member of the bar of the District of Columbia.

Thos. G. Steward, the third member of the Board was appointed clerk in the General Land Office in 1879, from Illinois; entered a competitive examination for, and was appointed as third Assistant Examiner in the United States Patent Office in 1881, under Commissioner Marble, this being at the time the lowest grade in the examining corps. He was promoted from time to time, becoming in 1887, principal examiner of the Division of Stoves and Furnaces. On May 27, 1879 he was appointed Examiner-in-Chief by President McKinley. He was for almost ten years prior to the appointment Secretary of the Civil Service Board of Examiners for the Patent Office. He is a civil engineer, a graduate at law, and a member of the bar of the Supreme Court of the District of Columbia. He is a native of the State of New York, having been born in Cambridge, Washington Co. in 1857. Before entering the service of the Government, he was successively a grocer's clerk, a book-keeper and a machinist.

S. 3022.

## A BILL

To provide for lessening the number of appeals in applications for patents.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That section four hundred and seventy-six of the Revised Statutes be, and the same is, hereby amended to read as follows: SEC. 476. There shall be in the Patent Office a Commissioner of Patents and three assistant commissioners, who shall be appointed by the President, by and with the advice and consent of the Senate. The assistant commissioners first appointed under this Act shall continue in office for the terms of two, four, and six years, respectively, from the first day of July, Anno Domini nineteen hundred, the term of each to be designated by the President, but the successors of the assistant commissioners shall be appointed for the term of six years, except that any person chosen to fill a vacancy shall be appointed only for the unexpired term of the assistant commissioner whom he shall succeed. Any of the assistant commissioners may be reappointed by the President, by and with the advice and consent of the Senate. Not more than two of the assistant commissioners shall be appointed from the same political party. The Commissioner and the assistant commissioners shall be persons of competent legal knowledge and scientific ability and well versed in the patent law.

"All other officers, clerks, and employees authorized by law for the office shall be appointed by the Secretary of the Interior upon the nomination of the Commissioner of Patents."

Sec. 2. That section four hundred and eighty-one of the Revised Stat-

utes be, and the same is, hereby amended by adding at the end thereof the following:

The Commissioner of Patents and the assistant commissioners shall constitute a tribunal whose duty it shall be, upon a written appeal, to revise and determine upon the validity of adverse decisions of the principal examiners upon applications for patent and for reissues of patents, and decisions of the examiner of interferences awarding priority of invention in interference cases. The Commissioner of Patents, with any two of the assistant commissioners, or the three assistant commissioners, shall constitute a quorum of this tribunal for the determination of any such appeal, and the Commissioner of Patents, or any one of the assistant commissioners designated by the Commissioner, shall, upon a written petition, hear and determine upon the validity of the decisions of the principal examiners or the examiner of interferences upon any preliminary or interlocutory matter not involving the merits of an application for patent or the question of priority of invention. The assistant commissioners, when required by the Commissioner, shall perform such other duties pertaining to the office of Commissioner of Patents as he may assign them, and one of them may, upon his designation, act as Commissioner in his absence.

Sec. 3. That section forty-nine hundred and thirty-four of the Revised Statutes be, and the same is, hereby amended by canceling the words "On an appeal for the first time from the primary examiner to the examiners in chief, ten dollars; on every appeal from the examiners-in-chief to the Commissioner, twenty dollars," and inserting in lieu thereof, "On every appeal from the primary examiners, ten dollars; on every appeal from the examiner of interferences, twenty dollars."

Sec. 4. That the right of appeal from the decisions of the Commissioner of Patents now authorized, to the Court of Appeals of the District of Columbia, by section nine of an "Act to establish a court of appeals for the District of Columbia, and for other purposes," approved February ninth, eighteen hundred and ninety-three, be, and the same is, hereby abolished.

Sec. 5. That all appeals from the decisions of the examiners in chief or from the decisions of the Commissioner of Patents, taken in accordance with existing law and pending at the date at which this Act takes effect, shall be proceeded with to final disposition as if this Act had not been passed, but all appeals taken in accordance with existing law from principal examiners or from the examiner in charge of interferences to the board of examiners in chief, and pending at the date at which this Act takes effect, shall be heard and determined by the tribunal created by section one of this Act without additional fee.

Sec. 6. That all laws and parts of laws inconsistent with this Act, or with any of the provisions thereof, be, and the same are, hereby repealed.

Sec. 7. That any money in the Treasury not otherwise appropriated shall be available to carry out the provisions of this Act.

Sec. 8. That this Act shall take effect on the first day of July, anno Domini nineteen hundred.



## RECENTLY PATENTED MECHANICAL INVENTIONS AND DESIGNS

Procured through the Patent  
Soliciting Department of E. G. SIGGERS.  
Washington, D. C.

Albert A. Armitage, Kenesaw, Nebr.  
**Stove Pipe Coupling.**—This invention comprises very simple but effective means for locking the sections of a stove-pipe closely together to prevent soot and flame from leaking through the joints, and to avoid the necessity for the employment of wire or other braces. It comprises a series of bolts arranged to fit in slots in the end of the pipe, and means which prevent the clamping bolts from turning during the operation of coupling.

Floyd E. Morrison, Elk Lick, Pa.  
**Strainer Lid for Cooking Vessels.**—The present invention is a very desirable and useful household article that will commend itself. It provides means for firmly locking the cover in place on the vessel, such locking mechanism being adjustable and adapting itself readily to the vessel. A further advantage lies in an improved strainer and means for closing the same to retain the steam within the vessel.

Anton Bergerson, Stoddard, Wis.  
**Pipe Grab.**—A pair of clamping members are so arranged that they will securely clamp a pipe without injuring the same. The members are connected to suitable mechanism by which they are operated to raise the pipe from wells. The device is positive in action, and may be used as a wrench to unscrew the sections of pipe.

Edward J. Byrne, assignor to Stevenson & Co., Baltimore, Md.  
**Submerged Heater.**—This is a very simple but useful device which is adapted to be placed in a bath tub and heat the water contained therein. It consists substantially of a chamber which is adapted to be submerged in the tub, and a burner arranged within the chamber. Suitable flues are provided for the circulation of air to and from the chamber, and the construction is such that all the surfaces are uniformly heated.

Benjamin F. Crowder, Henry Station, Tenn.  
**Churn.**—A lever pivoted at its center to a supporting standard is connected at each end to reciprocating churn dashers. The lever is operated through suitable mechanism by a rotary crank. The construction and arrangement of parts, which includes a convenient seat for the operator, is simple and compact, and being inexpensive, is within the reach of every farmer.

William Gepford, West Salem, Ohio.  
**Thill Coupling.**—An axle clip is provided with an extension having an eye therein. The thill iron has a rigid pintle which engages in this eye, and a pivotal latch locks the two parts securely in place. This construction makes a simple coupling, by which the pole or thills of a vehicle may be easily and quickly interchanged without the use of a wrench or other tool.

Thomas J. Ingels, Atchison, Kansas.  
**Current Wheel.**—The water-wheels are carried by a floating barge which is anchored or fastened out in a stream. The barge carries machinery for generating power, for instance electricity, which is carried by feed wires to the point of use. Suitable means are provided for controlling the position of the barge in order to obtain the highest power from the current. This device provides a comparatively inexpensive mode of obtaining power.

Joseph F. Kazmir, Dent, O. T.  
**Ditching Machine.**—This machine is

a very great advance in the art. It comprises efficient and compact apparatus which can be used in forming ditches, excavating, grading, canal and all kinds of analogous work. The machine is rapid in its work, and at the same time requires a minimum amount of power to run it, thus possessing many advantages over the ordinary machines.

Andrew Klay, Bluffton, Ohio.  
**Valve.**—A relief valve is arranged within a safety valve, in such a manner that it is normally open when the safety valve is closed. This device is designed for use in connection with locomotive cylinders or similar engines, and it provides a simple and efficient means which allows the water of condensation to be blown off on each stroke of the piston, and also provides a safety valve which is unseated by an excess of pressure.

Fred. M. Woods, Winfield, Kansas.  
**Ball Bearing Lubricator.**—The ball cup is provided with an angular pocket in the angle between the end wall and the body portion. This pocket receives a ring of absorbent material which retains the oil. By this construction of lubricant, the balls are kept properly supplied with oil, and at the same time, the dust and dirt that enters the bearing is collected and the ball cup is kept clean.

David M. Ellsworth, Camas, Washington.  
**Fruit Evaporator.** New and simple mechanism is provided for handling the stack so that the bottom tray may be removed and examined, and this mechanism can be operated quickly and with very little labor, thus overcoming many disadvantages found in this class of machines.

Ransom A. Grout, Estherville, Iowa.  
**Camera.**—This is a magazine camera designed to carry a number of cut films. Broadly, it comprises a removable magazine which carries a number of cut films pasted on an apron. As the films are exposed, they are drawn from the magazine by the apron, stripped therefrom and dropped into a receiving magazine which is also removable. This camera can be loaded or unloaded in daylight, and, at the same time, it is not necessary to wait until all the films have been used.

Levi W. Olmstead, Ansonia, Pa.  
**Safety Attachment for Car Trucks.**—The present invention is a simple device attached to the truck of a railway car and so constructed that should the wheels leave the track, an alarm will be automatically given to the engineer, the brakes of the train will be automatically applied, and the device will serve as a track brake and a guide to prevent the truck from further lateral movement. This device will prevent many accidents.

Darwin E. Wiseman, assignor to Glascock Bros. Manufacturing Company, Muncie, Indiana.  
**Combined Flour Bin and Spice Cabinet.**—A flour bin is provided at its lower end with a sifter and a receiver for the sifted flour. On each side of the bin are arranged tiers of spice drawers of improved construction, the whole device making a very simple and convenient cabinet, and a household necessity.

Jay J. Woodman, Napoleon, Ohio.  
**Signboard.**—A signboard of neat construction is supported by posts on the top of which are arranged pointers. These pointers are designed to show the distance from one place to another and are adjustable so as to indicate the exact direction. This makes a sign that is sure to attract attention, and will prove a convenience to the travelling public as well as a good advertising medium.

Robert M. Downie, Beaver Falls, Pa.  
**Dredging Pump.** This machine is designed to extract from the bottom of bored or drilled wells, any mineral or heavy substance. It consists of a tubular casing within which is mounted an endless dredging conveyor the lower end of which projects below the casing. The operating mechanism is mounted within the casing and the whole device is compact and efficient.

Gustave Hanke, Adair, Iowa.  
**Trace Buckle.**—The object of this invention is to provide a buckle especially designed for traces or heavy harness straps and it provides a new and simple construction whereby the strap can be quickly lengthened and shortened with the greatest ease possible. This advantage coupled with its cheapness makes it particularly commendable.

Frank C. Kirkpatrick, Smithville, Miss.  
**Churn.**—The churn body is supported upon a frame which carries efficient mechanism of an adjustable nature for operating the churn dasher. A rotary fly-fan is arranged in close relation to the churn and is run by the dasher operating mechanism, thus making a very efficient churn.

James A. Sears, Grand Haven, Kan.  
**Hay and Stock Rack.**—The ends of the bottom cross beams are provided with metallic hinge members, having obliquely disposed sockets. The standards are also provided with hinge members having tongues which fit in these sockets and are held therein by set screws. The end portions of the rack are hinged to the bottom by suitable means. This construction allows of easy and quick assembling and disassociation of the parts and the ends may be folded flat upon the bottom, advantages that will be highly appreciated by the farmer.

William H. and Freeman Walter, Dallas City, Ill.  
**Buggy Top Patch.**—This invention provides a neat patch which can be applied by any person to a buggy curtain when the metallic eyelet is torn from the same through rough handling or by accident. Heretofore it has been necessary to sew a new patch in, a job that is expensive and laborious when compared to the present invention, which consists in a patch having an eyelet therein and a metallic binding strip which engages the curtain and holds the patch securely in place.

John Q. Adams, Manchester Center, Vt.  
**Clothes Rack.**—The present invention provides a rack of simple construction adapted to be applied to a wall and capable of holding a large amount of clothing. When not in use it may be folded compactly together so that it is entirely out of the way; but can be instantly made ready to receive any number of articles of clothing. The device is inexpensive and will become a household necessity.

Alvin F. Florey, Washington, N. J.  
**Piano Attachment.**—This is a simple device for modifying the string tone produced by the operation of the hammers upon the string. The invention consists in providing flexible tongues having their ends provided with strips of wood veneer glued thereto. These tongues are arranged to be interposed between the string and the hammers when desired, so that the tongue will be struck against the string by the hammer thereby giving a very soft delicate tone.

William H. Beck, Cressona, Pa.  
**Trimmer Attachment.**—The present invention is designed as an attachment to looping machines which unite looped fabrics or knitted goods, and its purpose is to trim the rough edge portions in order to secure a neat, close seam. The method heretofore has been laborious and expensive, as

the portions had to be ravelled, and this device obviates these difficulties and is a forward step in the art.

George P. Brubaker, Berlin, Pa.  
**Pulley.**—This invention relates to the class of split pulleys and a novel construction provides among other advantages, means for facilitating the application of the device to a shaft without disturbing the latter, and also providing an adjustment to compensate for the expansion and contraction of the metallic shaft. A further advantage of great merit is the provision for the circulation of air through the pulley bridge-trees whereby the air resistance is reduced with a consequent economy of power.

Douglas M. Campbell, Houston, Texas.  
**Bale Band Fastener.** The invention is somewhat similar to a former patent to the same inventor, but in the present case the device includes members which provide for taking up a maximum amount of slack with a minimum movement, and at the same time securing it so there is absolutely no chance of the band loosening. At the same time the device occupies a small space and is easily manipulated.

John A. Leaf, Jefferson, Texas.  
**Saw Guide.**—This is a device to brace a circular saw against lateral vibration. It consists of a guide arm that engages on both sides of the saw, and is adapted to be raised to its operative position by automatic means connected directly to the saw driving-shaft and brought into action by a suitable hand lever. The device is a great improvement in the art, being useful and inexpensive.

Walter L. Martin, Moffett's Creek, Va.  
**Clothes Pin.**—The invention comprises a clamping device made of one piece of wire and adapted to be permanently but slidingly mounted on a clothes line so that it cannot be lost. At the same time when it clamps the clothes to the line, it is securely locked against any movement, and prevents all slipping of the clothes along the line. The device is a very useful novelty and, being inexpensive, will come into general use.

Walter E. Mayo, Montpelier, Ind.  
**Combined Shipping Package and Lantern.**—In this invention a package is provided which is securely held together by the lantern frame and protects the globe or chimney during transportation. The construction of the lantern is also new, and being simple and convenient, provides a construction that will find great favor.

Frank B. Moore, Portsmouth, Ohio.  
**Adjustable Window Shade Hanger.**—The present invention provides a vertically-movable shade-carrier arranged at the top of the window, and operating rods connected to the carrier and constituting means for elevating and lowering the same whereby the shade can be raised and lowered to ventilate a room or to darken the lower sash and admit light through the upper one. These are advantages that will be highly appreciated and make the invention extremely useful.

Henry A. Smith, Coshocton, Ohio.  
**Method of Making Transparent Signs.**—This invention relates to transparent signs, labels, etc., for advertising and decorative purposes and adapted for attachment to glass and similar transparent surfaces. In the manufacture of these signs, a very light varnish-clarified paper is used, and it is exceedingly difficult in multi-color printing to make the colors register. This is overcome in this invention by using a comparatively heavy backing-sheet which is attached to the object sheet by the transparent medium and along a single line of contact. The backing sheet holds the object sheet in proper position and completely prevents any distortion or stretching of the latter.



# *Inventive Age*

## AND PATENT INDEX.

Established 1889.

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### Our Pledge And Your Duty.

One year ago this month the present management took charge of this paper. At that time, we pledged ourselves that a radical improvement should be made in the paper. We leave it to our readers to decide if this pledge has been kept, though we venture the assertion that it has. We would, however, be false to our ambition if we expressed ourselves as wholly satisfied with the progress made in developing this paper into the ideal journal for inventors, but we have made a start in the right direction, and having our eyes fixed on the goal, shall press forward to attain it. In working towards this end, we shall need the support of inventors and manufacturers, and this can best be given us by subscribing for the paper and securing subscriptions from others. The premiums we offer in this issue should stimulate the efforts of our friends in sending in the names of new subscribers. A thousand new subscribers for 1900 is what we are working for. Will you not help us secure them?

### The Anthony Pollok Memorial Prize.

When the particulars concerning this prize were first made public, we, in common with every one else, supposed that there were no restrictions on the right of anyone to enter the contest. But it has turned out that "one must be an exhibitor in Class 33 (Equipment for Merchant Marine) in the Paris Exposition" in order to be accepted as a contestant. This provision seems to be directly in the interest of the French government and French contestants, and was dictated by the fact that the heirs of the estate of Mr. Pollok, who was a prominent Washington patent attorney, were Frenchmen. It is unfortunate that the facts concerning this necessary condition precedent to entry were not made known at first, as we are sure that many would have been deterred thereby from spending money in a fruitless effort to win the prize. We know of an instance where considerable expense on the part of an inventor, and parties backing him, were made which would not have been the case had all the requirements been made known at the start. This experience will probably make inventors exceedingly chary in the future of giving serious consideration to offers of prizes, emanating from French sources.

### Proposed Patent Legislation.

Interest is increasing, in Washington, at least, among the members of the patent profession, in the bill now pending before Congress to decrease the number of appeals in applications for patents, the full text of which is printed in another part of this paper. Some attorneys are opposed to the change, and are making their opposition felt, while others believe that the bill is a step in the right direction, and that something should be done to remedy the evils complained of in the annual report of the Commissioner of Patents, in which the Commissioner said:

"Nothing has impressed me more forcibly during the two years in which I have occupied the position of Commissioner of Patents than the advisability and necessity of limiting the number of appeals in 'merit' and 'interference' cases. Under the present statutes, if an application is rejected by the principal examiner an appeal lies to the Board of Examiners-in-Chief, and from that tribunal to the Commissioner of Patents in person, and from him to the Court of Appeals of the district of Columbia.

"In interference proceedings it is the same, save that the first appeal is from the Examiner of Interferences.

"In my opinion there should be but one appeal in the Patent office and no appeal to the Court of Appeals of the District of Columbia. The reason why there should be no appeal to the court is that under section 4915 of the Revised Statutes, the applicant to whom a patent is refused can prosecute his application in another court, and an aggrieved party in an interference proceeding can renew his contest in another court.

"I suggest an amendment to the statutes by which the board of Examiners-in-Chief be abolished and that in their place and in the place of the present Assistant Commissioner there be three Assistant Commissioners appointed, who, together with the Commissioner, shall be persons of competent legal knowledge, scientific ability, and well versed in patent law, and shall hear all appeals from the Primary Examiner and Examiner of Interferences. The Commissioner, with any two of the three Assistant Commissioners, shall have the power to review and determine upon all adverse decisions made by the Principal Examiners upon applications for patents and for reissue patents and of the decisions of the Examiner of Interferences on all questions relating to priority of invention. Such a system will lead to an early decision of the question, limit the number of appeals, thereby relieving inventors from an unnecessary burden, and will end the anomalous condition which now exists, in that one person—the Commissioner of Patents—reviews the decisions made by a board composed of three. Under the present statutes the decision of the Board of Examiners-in-Chief have not that force and effect that they ought, for the reason that their decisions are not final and are largely treated in 'merit' cases as only applying to the case in hand."

What the Commissioner says rela-

tive to the decisions of the Board of Examiners-in-Chief will be accepted as a fact without detracting in the slightest from the able character of their decisions. Both the friends and foes of the proposed legislation agree as to this, but there are many who think that the remedy lies not in abolishing that time-honored appellate tribunal, but rather in elevating it to its proper sphere. For instance, an amendment of the statutes which would allow only one appeal in "merit" cases, and that appeal to lie from the adverse decision of the Primary Examiner to the Board of Examiners-in-Chief, and require that the decisions of the appellate tribunal be published, would give due force and effect to such decisions, and at the same time properly lessen the number of appeals. There has been some adverse criticism of the pending bill because it might tend to make the Patent Office a political institution, for the Commissioner of Patents, being a member of the proposed "Board of Commissioners," would naturally dominate and influence its decisions and thus the end aimed at, i. e., uniformity and stability in the practice of the Patent Office, would be seriously menaced if not wholly defeated. It has been thought by many that the Commissioner should be relieved from all judicial duties, and that a permanent board having final appellate jurisdiction, be constituted. In this connection we call attention to the interview printed in another column, with one of the leading attorneys practicing before the Patent Office, whose name for obvious reasons, is withheld. His views on the proposed legislation are the result of many years practical experience within the Patent Office, and are entitled to great weight. The patent system would be elevated to its true plane if the plan proposed could be engrafted on the statute books.

It has occurred to the management of this paper, in view of the prevalent discussion, that now would be a favorable opportunity to show to the readers of THE AGE the Appeal Board of the Patent Office as it exists. Therefore we have the pleasure to present in this number life-like pictures of the room occupied by the Board of Examiners-in-Chief, with separate photographs of the individual members of that tribunal. This is the first time the Appeal Board has consented to be photographed, though repeated requests have, in the past, been made for that privilege.

We believe that much good will result from the discussion that is going on in patent circles, and that too much time and thought cannot be given in debating this subject from all standpoints. THE AGE invites correspondence from its readers and prominent attorneys, and will publish a limited number of articles on this subject, either over the signature of the senders or otherwise.

The Agricultural Department gives the result of some recent experiments for the prevention of black rot in cabbage, a disease that is annoying vegetable raisers in many parts of the country. They recommend planting other crops for a few years on the ground from which the effected cabbage is taken, and the destruction of cabbage bearing insects.

### The Rights of Workmen to Their Inventions.

According to a German newspaper the German federal court has recently rendered a decision in a peculiar case.

It appears that a foreman in the employ of a certain establishment invented a substance which his employer used in finishing "rustling" velvet. The use of this substance was considered a trade or business secret of the firm. The foreman, however, imparted the composition to others, and the firm had him tried under the law of May, 27, 1897, entitled "An act for the suppression of base competition." The foreman was found guilty in the lower court.

The case was appealed to the federal court and the defense made the point that the foreman had only imparted his own invention to others; that the same was his intellectual property. The federal court dismissed the appeal on the following grounds:

The foreman was employed as such by the firm, and therefore it was his duty to try experiments by which the methods of work could be improved.

His achievement in inventing the substance was therefore only a part of the services which he owed to his employers. The invention belonged to his employers, and therefore the action of the foreman in imparting the secret to outsiders was in violation of the law referred to. Only an employee is intrusted with experiments which may lead to such inventions. A stranger, whose labor does not belong to the establishment, is excluded from such experiments. The foreman was admitted to the experiments only on account of his employment by the firm, and it followed that the invention in question was made by him in consequence of his employment by the firm, for which he was paid.

This is indeed a peculiar case and one that could not arise under the English or the American practice. In this country, if an employee makes an invention during the course of his employment, the invention is his own and he alone can take out a valid patent thereon. But if he permits his employer to use the invention before making application for patent, the right to continue the use by the employer may be implied. This, however, does not give the employer control over the patent. He merely has a shop right in the patented invention, and such an interest is not assignable. Moreover, the inventor can dispose of the invention, outside of the shop of his employer, as he may see fit. Usually, the large manufacturing companies enter into contracts with their employees, whereby the latter obtain employment on condition that any improvement they may make on the machines of their employers shall be for the exclusive use of the employers, and such contracts have been held valid. But in the absence of an express agreement, a company or manufacturing corporation is not entitled to the conveyance of patents obtained by a skilled employee, even though such employee is employed for a stated compensation to take charge of the works and devote his time and services to devising and improving the manufactured articles.

When these facts are placed side by side with the German case, the liberal treatment accorded inventors by the Courts of this country is made manifest.



## SPECIAL OFFER TO PHOTOGRAPHERS.

THE INVENTIVE AGE makes a feature of illustrating new inventions and new triumphs in engineering and mechanics.

Under this heading may be classed the building of canals and waterways, modern vessels and war ships, modern buildings, interior views of model machine shops and factories, railroad bridges, views of engineering achievements of every nature, natural wonders and discoveries, new machines, engines, motors and developments in electrical science, novelties, labor saving devices, etc.

We desire the assistance and co-operation of amateur and professional photographers everywhere. Every photographer has in his collection, or can obtain, one or more views that can be used in the AGE. We also want photos of prominent inventors as well as their inventions.

Not only will we give the artist credit for any view used, but in addition we will forward the AGE free one year to his address. In instances of special merit and views of extraordinary achievements of genius and labor, cash prizes will be awarded.

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It is also desired that accompanying each view, there should be sent a complete description of the subject or enterprise, or that the address of some person be given from whom complete information can be obtained.

### Modern Guns.

The work of preparation for defending the coasts of the United States is progressing very well. There are now 85 12-inch, 118 10-inch, 94 8-inch, 308 rapid-firing guns, and 344 12-inch mortars in place. The manner of mounting modern coast-defense guns is altogether different from the old methods of mounting such guns. A 12-inch gun is now mounted simply in a hole in the ground prepared for it upon a disappearing carriage, as we call it. The carriage revolves upon a circle upon which the degrees are marked out—north, east, south, and west. The gun is sighted while down in the hole. The range finder reports at sea, 4 miles away, at 10° east of north, a vessel. Then the gun is swung around on the carriage to the point desired, so many degrees east of north as given by the range finder. Then they go to the breech of the gun and give it the proper elevation to shoot 4 miles. They then operate the ratchet and the gun tips up out of the hole and fires. If the range finder does his duty, the shot hits every time. That is the difference between the present manner of mounting guns and the old way, when they had to fire out of portholes.

Two 12-inch guns may be mounted now on disappearing carriages at a cost of about \$250,000. By means of the disappearing carriage, the firing can be more accurate and rapid, and the range of the gun is much greater, as by means of the disappearing carriage, it is possible to fire in any direction.

## More Room For The Patent Office.

This has been the crying need of the Patent Office, voiced in the reports of various Commissioners of Patents for a score of years. And yet a solution of the matter is as far off today as when first brought to the attention of Congress. During the last administration of the Patent Office, the demand for room became so pressing that the fine old model halls on the third floor of the Patent Office building were turned into office rooms after the removal of the models to outside quarters. There were many who viewed with regret the removal of the models from the Patent Office, as visitors to the National Capital always looked upon the model halls as one of the sights of Washington. In their present quarters the models are not displayed to advantage, and hence are viewed by those only whose business compels them to examine them.

The bill introduced by Senator Daniel of Virginia therefore commends itself to the support of every patentee and manufacturer who is interested in the growth of the patent system. The bill, which was commented on in the December number of the "AGE," provides for the construction of "a fire proof building for the use and accommodation of the U. S. Patent Office, including a Hall of Invention," whereby the business of the Office can be more conveniently and safely carried on, and at the same time ample space is given for illustrating the growth of the industrial arts by means of suitable models.

It was in deference to the repeated demands of the Patent Office that Congress arranged for the removal of the Post Office Department to the City Post Office building, and the transference of the General Land Office from the Patent Office to the General Post Office building. Everyone inside the Patent Office expected, and no doubt Congress so intended, that the Patent Office would fall heir to the rooms vacated by the Land Office. But what has happened? The Secretary of the Interior, the Assistant Secretaries, and other bureau officers have taken advantage of the situation to enlarge their own quarters to the detriment of the Patent Office and thus the building which was built originally for the needs of the Patent Office—and that name still clings to it—remains the Patent Office in name only, as the principal rooms are given over to the offices of the Department of the Interior. The Commissioner of Patents, in his last annual report, has again brought this matter to the attention of Congress. In part he says:

"The expectation expressed in my last annual report that 'in a few months some additional room will be placed at our disposal' has not yet been realized. The work of the Office in all of its branches is hampered by lack of necessary room. Even when the General Land Office vacates the Patent Office building, room sufficient for the necessary work of the Office will not be available. The business of this Office increases from year to year, and consequently the necessity for more space, especially for storage purposes, cannot be too strongly emphasized. Some of these records constitute the legal evidence of title of

many of the large manufacturing industries of the country, while others disclose the proceedings in this Office when the applications for the issued patents were pending, and it is self-evident that all of these should be preserved in a fireproof building. Their loss would work an incalculable injury, not alone to the owners of the patents, but to the public in general.

"The American Society of Mechanical Engineers, The Patent Bar Association of Chicago, The National Association of Agricultural Implement and Vehicle Manufacturers, as well as other organizations and individuals, have forcefully called to the attention of your honorable bodies the necessity of such a building.

It is now almost universally recognized that this country owes a debt of gratitude to its inventors and progressive manufacturers. In view of the well-known fact that the inventors of the country have paid all the expenses of carrying on the Patent Office, and that this Office has covered into the Treasury over five millions of dollars in excess of all expenditures, no more fitting way of recognizing the value of the patent system to the country can be found than by using this money for the erection of a suitable building in which the business of the Office can be conveniently and safely carried on, and at the same time giving ample space for illustrating the growth of the industrial arts by means of suitable models."

The Patent Office is not a political institution like the Pension Office, and largely for that reason it has to beg before Congress long and earnestly for the slightest favor. The business of granting patents is always conducted at a profit to the government, and one would suppose that this consideration would appeal to the judgment and conscience of the National Legislature. But the contrary is the case. Congress is loath to grant the appeals made each session, for proper legislation in behalf of the Patent Office, and not until the inventors of this country take the matter in hand, will anything be done to remedy the evil. Congressmen should be written to by their constituents urging them to vote for Senator Daniel's bill, and they should be made to understand that inventors, as well as pensioners, have votes. If inventors only knew the advantages that would accrue to their interest by the passage of such a bill as that proposed by Senator Daniels, a wave of sentiment would soon be created that would carry all opposition before it and place the Patent Office in the honored position it should occupy in the group of public offices at the National Capital.

### India Rubber.

Consul General R. A. Moseley, Jr. writes to the State Department from Singapore stating that from his knowledge of the climate, soil, and moisture in the southern part of the States of Georgia, Alabama, Mississippi, Louisiana, and Texas, he can not but believe that the rubber tree will grow there and be a profitable crop. Even small yields can be profitably worked now-adays, owing to a machine lately invented by Mr. Biffen, of Cambridge University, which does away with much of the labor and processes needful to separate and consolidate the rubber from the latex.

By Mr. Biffen's invention, the Pana-

ma tree from its greater outflow of milk, even if containing less rubber, and the fewer incisions and consequently less labor that it requires—has become more valuable than the Para rubber tree. According to experiments carried out in Ceylon, the outflow of latex from an incision from the former is about ten times as great. The amount of Rubber, too, collected from a quarter of the number of incisions, is larger than in Para trees of similar age.

The manufacture of the milk into marketable rubber is extremely simple. The cost on a plantation of 300 acres in Ceylon up to the end of the tenth year, with interest, has been reckoned at \$75,000, and the return, at, say, about 10 per cent on the original outlay.

### A New Feature Of The Age.

THE INVENTIVE AGE is distinctively the inventors friend and guide, and its columns are open to them for the purpose of presenting to the world the merits of their various inventions, embellished with cuts made from the Patent Office drawings or otherwise. THE INVENTIVE AGE will publish a description of any meritorious patent, together with a single column cut, and furnish 25 copies of the number containing the article for \$5, if the article does not exceed one third of a column, (about 175 words); one half column, (about 275 words), \$8; one column, (about 600 words), \$10. This includes cut, which becomes the property of the advertiser. When cut is furnished by the patentee, we will allow fifty copies of the "AGE." If additional copies of the magazine are desired, they will be furnished at the rate of \$5 a hundred. For a larger number, or longer article, write for special terms. To insure publication, all articles and copy for advertisements should be in by the first of the month.

### Our Plea.

Patentees should keep themselves informed as to the progress of invention in the line of industry in which they are interested. Frequently, improvements on their patents are patented by others, which are clear infringements of their rights, for the grant of a patent does not, as is commonly supposed by some, settle the question of infringement. An earlier patent may infringe a later one, or *vice versa*. By keeping posted on the issue of patents each week, an infringement may be stopped before it has done much, if any, harm.

This desirable end can be attained by subscribing for a paper that contains an index of all the patents that are issued by the Patent Office. THE INVENTIVE AGE is the cheapest medium through which this information can be secured. Can you afford to do without it?

Bordeaux mixture is highly recommended by the Agricultural Department not only for disease in potatoes, but for producing a lavish growth. Three or four applications have increased the crop 50 per cent. The formula is: A 50 gallon barrel half filled with clean water. Tie 6 pounds of blue stone, or copper sulphate, in a coarse cloth and suspend just under the surface of the water in the barrel. Slack 4 pounds of fresh lime in another vessel, by pouring water over it slowly to give a smooth paste, until 25 gallons is added. Then mix the two liquids thoroughly.



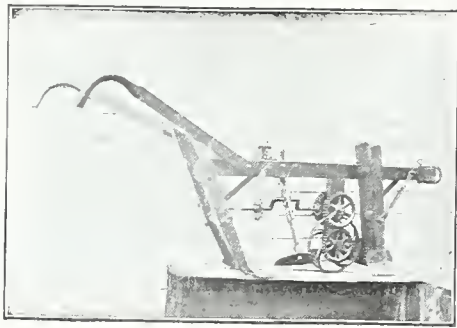
### A Word of Caution About Liquid Air.

The advertisements which are now appearing in papers all over the country of companies who are to furnish liquid air on a large scale must be accepted with a great deal of caution. The public mind has been very adroitly worked up for the reception of these by lectures, paragraphs in the press and other well understood methods. Undoubtedly liquid air possesses some valuable properties and many striking experiments can be performed with it. It is not by any means certain yet that it can be prepared, transported and used economically on a commercial scale; or that the difficulties in the way have been overcome. We do not say that they may not be overcome in the future; but to talk, as the advertisements do, of the certainty that liquid air will soon largely replace steam in furnishing motive power, is going entirely too far. Such assertions have no present basis of fact to warrant anyone in making them. The liquid air people have a great deal to do yet before they can establish their claims or carry on business on a scale that will warrant the organization of \$10,000,000 companies. The question of validity of patents is also quite an open one. It is doubtful if there is any valid patent on this subject.—Engineering and Mining Journal.

**A Great Invention.**—The Eccentric Trace Fastener. For States and Territories, and other information, address John A. Brownwell & Co., Rockwall, Texas.

### A New Cotton Chopper.

Below we present a view of a novel cotton chopper that will interest manufacturers and cotton raisers. The machine is arranged so that it will cultivate on each side of the cotton row. As shown in the illustration the



invention comprises a swinging hoe pivotally hung to the beam and operated through a series of gear wheels by a ground wheel arranged in front and on one side of the hoe. Different sized hoes may be used—eight, seven and six inch, according to the stand of cotton, the first cutting out eight inches and leaving a half inch standing, the latter cutting out six inches and leaving one and one-half inches. Cultivator shovels are arranged on each side of the row and the whole forms a very complete and efficient machine.

The device is the invention of Mr. Alexander Carr, of Chambersville, Arkansas, and any one who is interested in the machine and desires further information in regard to it, should write to this gentleman, who can more fully set forth its value and advantages than is possible in a short article of this description.

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## PATENTS



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## HOW TO INVENT.

## The Professional Inventor a Model.

By D. P. WOLHAUPTER.

In every department of labor and production, the work of the inventor and mechanic is seen, and an era of mechanical triumphs has made the United States the leading manufacturing country of the world. These, the work of the inventor and mechanic, are still the lines of development on which the future of our country is to depend. It is in these directions that we are to work to make the United States the foremost among nations, and the education of inventors to work out their ideas along intelligent and practical lines, becomes of importance to maintain the standard of mechanical excellence and insure the greatest benefit to the individual. This article is therefore directed to encourage and stimulate invention in practical channels, by suggesting methods that may be advantageously adopted by all inventors.

The figure of the "crank" inventor is now largely a child of history and fiction, and in his place we have, as the average type of inventor, one of intelligence and good business ideas, whose visions of fortunes and air-castles are subordinated to a knowledge of the necessity of careful work and a painstaking development of his invention, to secure success. The science of invention, if I may so call it, has now reached a stage where it has found both employers and exploiters, and it is no longer a dubious compliment for a man to be called an inventor, especially if it be applied to the methodical business-like person, whose capacity and usefulness in the community is a known quantity. No better or more commendable work than that of giving birth to useful ideas, and their development into practical shape, can be entered into by any one, and our inquiry is to ascertain the best method to follow in the working out of an invention.

The art of knowing how to invent has in recent years been developed to a high degree by many well known inventors, to whom has been properly given the appellation of "professional" inventors. Their mode of procedure in the development of an idea is undeniably the way to secure a maximum standard of mechanical excellence, and therefore they furnish the best possible model to follow in making an invention. As the result of the marvelous work of these specialists, the title of "inventor" has been turned from one of reproach to one of honor, and invention has become a legitimate profession, with its workers in every branch. Today we have the ablest engineers, mechanics, and physicists studying and devising practical methods for solving mechanical problems, but this does not mean that any system of originating invention can be devised that will dispense with the genius of the inventor, or with the work of our lay inventors.

As showing more definitely the work of the professional inventor, when this individual undertakes to develop a device, he follows the usual and sensible course; that is, to first inform himself, as fully as possible, of the end to be accomplished, and unless the problem is an entirely new one, he finds out what plans have already been employed by others for the same or similar purposes. Here at once is the difference between the older and later methods. Formerly, an idea occurred to a man and he forthwith proceeded to complete the invention with thoughtless haste, often entirely unaware whether or not any one really needed such a device, and usually blissfully ignorant of what others had already done, or failed to do, in the same field. Apropos of this point, one of many similar instances occurs to mind. A really ingenious mechanic conceived the idea of finishing, in one operation, a number of holes in an irregular casting for receiving the ends of wrought-

iron tubes, which tubes were afterwards to be secured by expansion to form steam-tight joints. He gave considerable study to the idea and produced a really excellent and elaborate mechanical apparatus for securing the finishing operation; but when it was submitted to the manufacturers, lo-and-behold! he was shocked to find that the castings themselves were so perfectly made that no finishing operation was necessary at all, and neither his, nor any other device, was necessary or even useful for the proper fit of the tubes. This is an example of why many inventions fail to be of benefit to their originators, and shows it to be of prime importance that an inventor, before proceeding to any great extent with an idea, should first ascertain the presence or absence of a demand therefor, and whether or not it possesses practical utility.

Some inventors develop ideas along special lines. This is particularly true of our specialist, who therefore keeps himself fully posted as to the state of the art in which his specialties lie, always scanning closely the issues of the Patent Office publications, and in general keeping his eyes open. This part of the work, while not really invention in any sense, forms a record of mechanical ideas from which the inventor draws data to enable him to readily determine the practicability or impracticability of a device. Of course, the average person, who does not make a regular business of inventing, need not carry this idea out so exhaustively, but a very practical suggestion is contained in the research of the professional inventor, and that is, when a particular idea has been conceived and is to be developed, the inventor should avail himself of all sources of information in this particular line. He can easily procure from his patent attorney copies of patents which will give a comprehensive idea of the state of the art, and permit him to analyze his invention in the light of similar ones which have already been patented. He should then study the different mechanical expedients by which the idea can be carried into effect, and if possible, experiment to determine which form of construction and method of operation presents the invention in the most thoroughly practical aspect. The inventor is then in a position to submit the invention to his patent attorney in such shape that the application for patent may be drawn up in a way commensurate with the scope of the invention.

The professional inventor never overlooks what some inventors regard as trifling details. Even parts of a machine which are not subject for a claim, are given as close scrutiny, to determine their availability, as other parts which constitute the gist of the invention, and therefore he is always seeking for the most practical and useful solution of his problem. This method of procedure is well exemplified by the familiar Biblical story of Cyrus, when besieging Babylon. Upon approaching the city with his army, the most obvious way which presented itself of entering, was through the natural channel, namely, the "city gates," but finding an impassable barrier there, the next expedient which occurred to him was to enter over the top of the walls. Finding this equally impracticable, it was then discovered that tunneling beneath the walls was the most available and practical method of taking the city by storm; and herein lies the whole secret of producing an invention in the shape and form that will be most suitable for the purposes intended. A thorough knowledge of the situation must first be obtained, the difficulties to be overcome thoroughly analyzed, and then a careful and judicious selection made of the best solution out of a number previously considered and tried.

Perhaps the greatest difficulty experienced by an inventor is finding the most mechanical and generally satisfactory embodiment of his inven-

tion. This is specially true in the working out of entirely new mechanical problems. The experience of the professional inventor teaches that in such cases it is generally best to ignore, except for comparison, the present means of accomplishing a given result, and to attack the problem as if it were for the first time a subject of mechanical interest. This method secures a concentration of the mind upon the subject that is impossible where the inventor endeavors to work out his idea, and at the same time carry along the expedients that others have resorted to. It has always been found that the greatest originality is evidenced by an inventor working out his invention along these lines. Yet, even while pursuing this course, an inventor should not be disappointed if he does not succeed with his first invention, or even with a series of inventions. Such failures are due to a number of well recognized causes, and the experience gained by failures is generally a better teacher than that gained by success. An inventor's knowledge of science and the arts may be only theoretical, or it may be only practical. It is seldom thorough in both respects. If he has neither a theoretical nor a practical knowledge of the art he seeks to improve, he cannot reasonably hope to make inventions that will command respect, although it is true that persons sometimes stumble across, and really develop in a satisfactory shape, inventions of remarkable merit. This, however, is the exception rather than the rule, and it may be well to note briefly some of the causes why inventions fail.

In the first place, the solution of an idea may be entirely new, and yet inferior to that in use. In such a case, the inventor could hardly hope to displace the invention or device already in use, and the same condition presents itself where an invention is entirely new and yet so expensive as to prevent its being adopted. This at once suggests the desirability of an inventor seeking not only the most practical, but also the simplest, method of carrying out his idea. A cause of failure of many inventions, which should be guarded against with the greatest care, is inoperativeness. This emphasizes the necessity of scrupulously considering the availability and operativeness of the smallest details of an invention. Another cause why really valuable ideas often fail to command attention, is that most inventors stop at an apparently satisfactory solution, when perhaps the very next step would greatly surpass it. Yet it is thus an art grows step by step, and one man is enabled to surpass another until the problems of the art are all solved. This is the evolution of invention, and there is a world of suggestion in it for the thoughtful and careful inventor.

Enough has been said to indicate in a general way the well accepted lines of thought and development which should be pursued by all inventors, but there is one fact above all others which inventors of the present day and generation should be impressed with, namely, the truism expressed by Archimides, who stated of mathemat-

ics that "there is no royal road by which success can be reached." This is especially true of invention, and the one succeeds better than another who realizes that real study and work are necessary to secure the desired goal.

The few suggestions made have been largely drawn by the writer from the school of experience, who believes that the work of the professional inventor affords the only model for the average inventor. The subject is intended to open up a view which should give stimulus to the cultivation of the art of inventing along lines of intelligence and thoroughness, so that inventors might have a better foundation upon which to build, and may hope to acquire the success and credit which their labors deserve. Along such lines we can also hope to reach up to the ideal age of invention.

To keep themselves posted in the progress of the art in which they are interested, inventors and manufacturers should subscribe for the INVENTIVE AGE, which publishes a list of all patents issued each month. The low subscription price and the character of the publication, entitle it to the support of all the inventors of the country.

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E. G. Siggers, After Nineteen Years Practice with Others, Branches out For Himself And Achieves Phenomenal Success.

### SKETCHES OF HIS ASSISTANTS.



E. G. SIGGERS.

No stranger who visits the offices of E. G. Siggers, on the third floor of 918 F Street, would easily guess that the entire business, giving employment to 25 assistants, clerks, and workmen, had been built up in the short space of a year. Yet such is the fact. The busy offices filled with clerks, the correspondence room from whence nearly a thousand letters are sent out every day, the long corridor lined with shelves filled with models, and the businesslike office of Mr. Siggers himself, have all been created out of nothing, as it were, in twelve months. Tuesday, May 1, 1900, was the anniversary of the day on which Mr. Siggers started out as an independent attorney after years of experience in assisting others—years in which he learned every detail of the patent business. That he has been able to build up such a huge business, and yet to keep its various branches so specialized that the interests of each individual client receive the same attention and care that they did when the office was small, was, and is, possible only through Mr. Siggers' ceaseless attention to detail and his tireless energy and application.

The man who created all this must possess rare business ability. Edward Gregory Siggers, late a member of C. A. Snow & Co., is a Virginian by birth, son of an English father and a New York mother, and is 36 years of age, having been born on February 14, 1864.

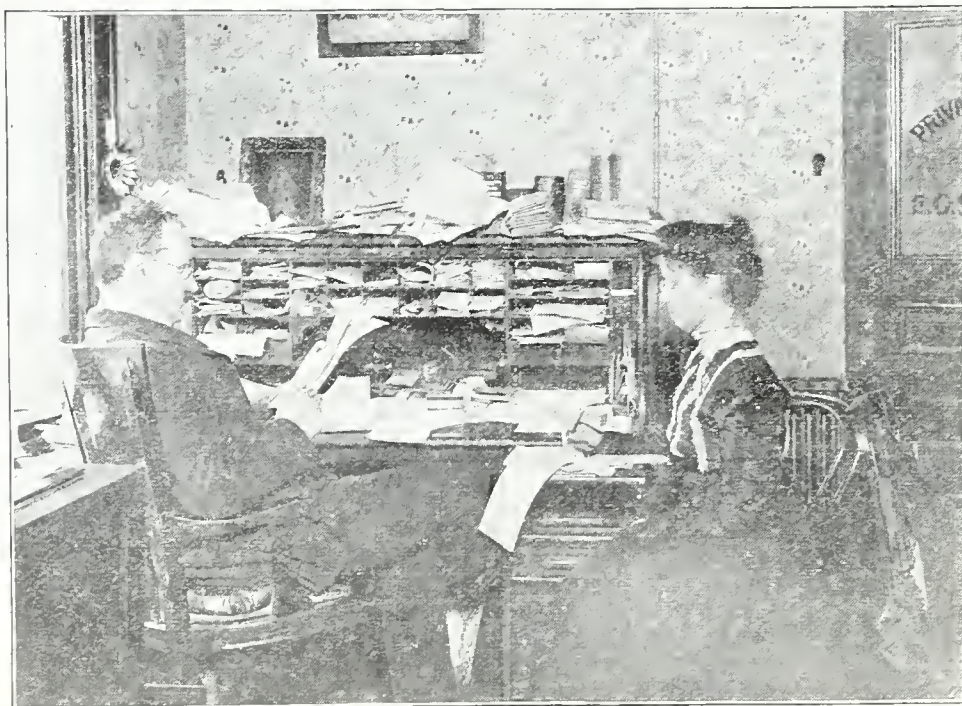
At the age of four, his parents moved to Washington, where he received his education in the public schools. At the age of 16, he left school and accepted a place in the office of W. H. Babcock, a patent attorney, staying with him until October 1882, when he secured employment in the office of C. A. Snow, then occupying two rooms on the first floor of 707 G Street. The employees consisted of three others

besides Mr. Siggers, the drawings being made outside the office by a local draftsman.

While connected with Mr. Babcock, Mr. Siggers had become fairly well posted in the routine work of the Patent Office, had made preliminary examinations to determine the patentability of inventions and had prosecuted a number of applications for patents, so that at the time of accepting a place in the office of C. A. Snow he was prepared to take up any branch of the patent business, needing only experience and a more thorough acquaintance with the patent laws. Within a year after his entrance into the office of C. A. Snow, his ability made itself felt. By strict attention to the business before him, he rose, in that short time, to the head of the small office force. Just about this time Mr. Siggers received a flattering offer from a Philadelphia patent attorney who desired him to take charge of a Washington office which he intended to open. Mr. Siggers seriously considered this proposal, but on mentioning the matter to Mr. Snow, he received assurances that some time in the future he would be made partner in the business.

In view of this understanding, Mr. Siggers decided to remain. Casting his lot with Mr. Snow, for seventeen years he devoted the best efforts of his life to building up the business and elevating the name of the firm.

On February 14, 1885, when Mr. Siggers was 21 years old, he was taken in as a member of the firm, and until May 1, 1899, the firm remained as then constituted. During the years 1887-88-89 he took a course in law at the National University, and was admitted to the bar of the Supreme Court of the District of Columbia in June, 1889. In June 1896, he received the degree of Master of Patent Laws from the Columbian University of Washington, D. C.



ROOM 20. PRIVATE OFFICE OF E. G. SIGGERS.

In the first articles of co-partnership between C. A. Snow and E. G. Siggers, it was stipulated that the "said C. A. Snow is to have the entire control of the finances of the concern." This condition remained in force until 1895, when articles were drawn up which gave Mr. Siggers the sole management of the business of the firm in the following language:

"It is further agreed that during the year 1895, the said E. G. Siggers is to have the sole charge and management of the conduct and working of the said business; that he shall have the sole right to engage and discharge assistants and employees; that he shall have sole and entire charge of the finances of the concern, shall pay all bills, charges, employees', clerks', and assistants' wages and the like."

"It is further understood and agreed that the said C. A. Snow shall have control and liberty of his time,

ventors whose work required special care and attention, but exercised more authority over the work done by the subordinates of the office. The business gradually increasing under the watchful care and unceasing vigilance of Mr. Siggers, the office force was augmented from time to time as the demands of the office justified.

Some idea of the growth of the business may be gained from the statement that when the said E. G. Siggers entered the office of C. A. Snow in October, 1882, the office force consisted of



ROOM 21. MR. D. P. WOLHAUPTER'S ROOM.

and that such work as he may do during the year 1895 for the firm will be voluntary."

This was for one year, but it was continued by stipulation from year to year until April 1, 1899. During all these years, Mr. Siggers had made such advance in his profession as to win the support and esteem of many prominent inventors. For some time prior to his entrance into the firm, Mr. Siggers had practical charge of the office, and to him was assigned

three employees occupying two rooms; and on May 1, 1899, when the co-partnership existing between C. A. Snow and E. G. Siggers was dissolved, the firm employed in the neighborhood of forty clerks and occupied the entire sixth floor of the Warder building and two rooms on the fifth floor.

It was required by the articles of co-partnership that three months notice of a desire to terminate the agreement should be given, but Mr. Snow, being absent in Europe during the summer and fall of 1894, on a pleasure trip, Mr. Siggers served the notice prior to October 1, 1894, announcing his desire to separate himself from the firm, and proceeded to make arrangements to start in business for himself; but owing to the intercession of mutual friends, and the concession on the part of C. A. Snow of certain things demanded by Mr. Siggers, new articles of agreement were drawn, which took effect, as stated, January 1, 1895, whereby Mr. Siggers had exclusive charge thereafter of the conduct of the office, and could employ whom he pleased in the management of the business.

Possessing always a high ideal as to the qualifications of an attorney, he would not tolerate anyone in the office who failed to work in line with his policy of protecting and guarding the interests of the inventor.

One reason why Mr. Siggers remained with C. A. Snow was because promises were made to him by Mr. Snow, that as soon as the sale of a large piece of property which he owned could be effected, he would retire from the business, and turn every thing over to Mr. Siggers, the business to be acquired and paid for by annual payments. It was only because of this inducement that Mr. Siggers remained so long in the firm.

for preparation and prosecution, all the difficult and particular applications for patents. All questions requiring a study or knowledge of the patent laws were submitted to him for determination. After he became a member of the firm, he still continued his practice of preparing the specifications in the applications of those in-

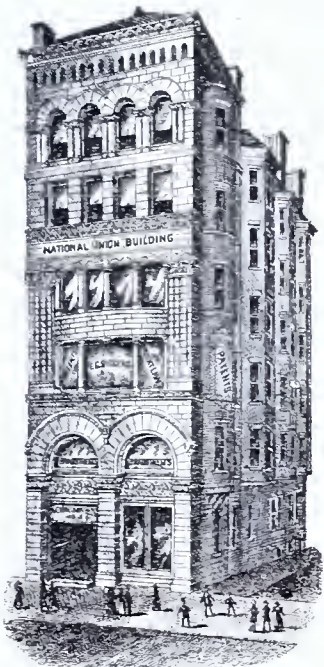




ROOM 22. PRELIMINARY EXAMINERS ROOM.

The property was sold by C. A. Snow in the spring of 1899, but Mr. Siggers saw no inclination on the part of Mr. Snow to stand by his agreement. On the contrary, there was an expressed desire on the part of Mr. Snow to recede from the agreement made in 1895 concerning the management of the business, which resulted in Mr. Snow refusing, on the first of April, 1899, to sign the agreement for another year, unless it were modified so as to give him the controlling voice in the management of the office. Believing that this would be inimical to his interests, Mr. Siggers refused to make any such concession, and after giving thirty days notice, the firm was dissolved on May 1, 1899.

On the dissolution of the firm, the pending business was divided between the parties, Mr. Snow taking his percentage of the applications for patents and Mr. Siggers his share. The office furniture and fixtures were also divided, and on May 1, 1899, Mr. Siggers moved into his present quarters in the National Union building, 918 F Street, N. W. A cut of this building is given below.



It will be observed that Mr. Siggers has selected advantageous quarters for his business. He is within one minute's walk of the Patent Office and his office building is one of the finest in the city. The Washington Agency of the Bradstreet Company have their offices immediately below him, and are familiar with the extent and nature of the business transacted by Mr. Siggers. Mr. Siggers being a subscriber to their reports, is at liberty to refer inquiring correspondents to them as to his reputation for fair dealing and his ability to carry out his contracts.

When the firm dissolved, Mr. D. P. Wolhaupter, who had been for a number of years associated with Mr. Sig-

gers in the conduct of the business of Snow and Siggers; Mr. John H. Siggers, who was the efficient chief clerk of the firm; Messrs Harold H. Simms and Bertram G. Foster, examiners who had made the preliminary examinations at the Patent Office; Miss Frances P. Smith, Mr. Siggers' personal sten-

ographer looks after the Patent Office work.

Mr. Siggers takes special pride in the fact that as early as 1884, when only twenty years old, he procured letters-patent No. 311,554 for Paul E. Wirt on his fountain pen, which patent was sustained in the courts, and was of considerable value to Mr. Wirt in enforcing his rights. See *Wirt vs. Brown*, 32 Fed. Rep. 283. As a result of this, Mr. Wirt, when he learned that Mr. Siggers was to start in business for himself, gave him the recommendation which follows:

"Bloomsburg, Pa.,  
April 19, 1899.

E. G. Siggers, Esq.  
My Dear Sir:

Your esteemed favor of the 17th instant, relative to the dissolution of your partnership with C. A. Snow, to hand. I take pleasure in noting that you are to open an office for patent business on your own account, in which I cannot but believe that you will succeed, if your clients are to continue to receive your able services.

You have my consent, of course, to refer inquiring clients or inventors to me, to whom I shall take pains to speak of the very efficient treatment my cases have always received at your hands.

Very truly yours,  
Paul E. Wirt."

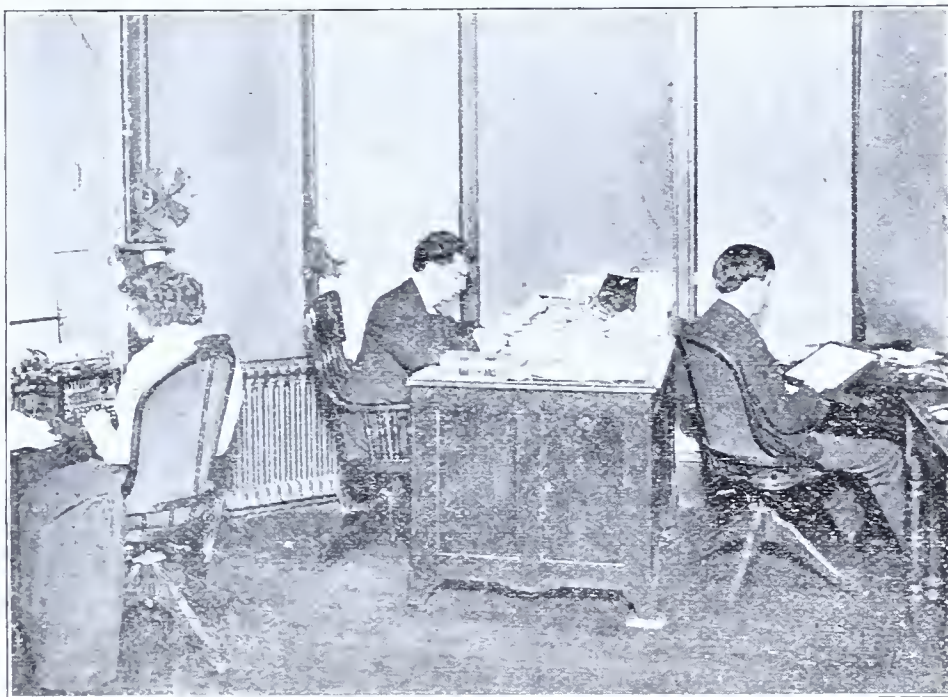


D. P. WOLHAUPTER.

Room 20 is the private office of E. G. Siggers, and is occupied by Mr. Siggers and his efficient stenographer and book-keeper, Miss Frances Peyton Smith. She has been Mr. Siggers' stenographer for nearly five years, and her initials, "FPS" will be found on most, if not all, of the important letters that were sent out from the other office.

Room 21 is occupied by Mr. D. P. Wolhaupter, Mr. J. K. McCathran, and Miss Ada V. Britt, Mr. Wolhaupter's personal stenographer. Mr. David P. Wolhaupter, age twenty-nine, a graduate of the Washington High School, entered the office of Snow & Siggers in 1889, as a draftsman, later took up the study of patent law and the preparation of specifications in patent applications, studied every branch of the business, and afterwards engaged exclusively in specification writing, legal opinions, and interferences. Mr. Wolhaupter was graduated from the National Law University in 1893, and in the same year was admitted to the bar of the Supreme Court of the District of Columbia. A special course in Patent Law at the Columbian University, Washington, D. C., was his next step, and in 1896, he received the degree of Master of Patent Law from the University.

He very soon distanced others below him in the office and finally, by dint of hard work and deserving progress, became the confidential assistant of Mr. Siggers, standing at the head of the specification-writing department of the firm. His work is always characterized by a thorough mastery



ROOM 23. MR. JULIHN'S ROOM.

nographer; and Mr. Edwin Vrooman, a clerk, left the office of Mr. Snow and went with Mr. Siggers and became identified with his fortunes. Since then, Mr. James K. McCathran, the chief draftsman of the firm, has left C. A. Snow's employ and is now with Mr. Siggers.

At present Mr. Siggers has an office force of twenty-five employees, and his offices occupy nine rooms on the third floor of the National Union Building. His Patent Office force comprises three specification writers, two examiners, six typewriters and stenographers, and three draftsmen.

In addition to the management of the patent business, Mr. Siggers conducts the *INVENTIVE AGE*, a scientific journal devoted to the patent business, and furnishes weekly correspondence to over 3,500 newspapers scattered throughout the United States and Canada. Mr. Crittenden Marriott, a well known Washington correspondent, is the editor of the *INVENTIVE AGE*, and is at the head of the newspaper correspondence division. He is a writer of rare ability, and has had much experience in United States and foreign work.

Mr. John H. Siggers occupies the same position in the office of his brother that he did in the old office, namely that of chief clerk, and Mr. D. P. Wol-

How the offices are arranged and brief sketches of the force employed in the various rooms may be of interest:



ROOM 24. MISCELLANEOUS WORK ROOM.





J. H. SIGGERS, CHIEF CLERK.

of the subject on which he is engaged. In the preparation of applications for patents in the classes of cotton machinery, typewriters, threshing machines, industrial designs, and applications for the registration of trademarks, he is considered an expert. In the office of Mr. Siggers he has charge of the specification-writers, draftsmen, and the preliminary examiners, and always attends to his work with the devotion so characteristic of him.

Mr. J. K. McCathran, age 34, who occupies the same room with Mr. Wolhaupter, has had a continuous experience as mechanical draftsman engaged in Patent Office work exclusively, for a period of fifteen years, ten years of which were spent in the office of Snow & Siggers. Few draftsmen in the city of Washington have made as many drawings for the Patent Office as he has. His name will be found on most of the drawings of the patents on complicated and mechanical inventions that bear the firm name. His forte lies in working up the details of a case. Many an inventor has come to him with only an idea in his head, and "Mac," as he is familiarly known, has succeeded in working out the details of construction, producing a practically working invention. There is no case too hard for him to draw, and for conscientious, all-round work, he has no equal.

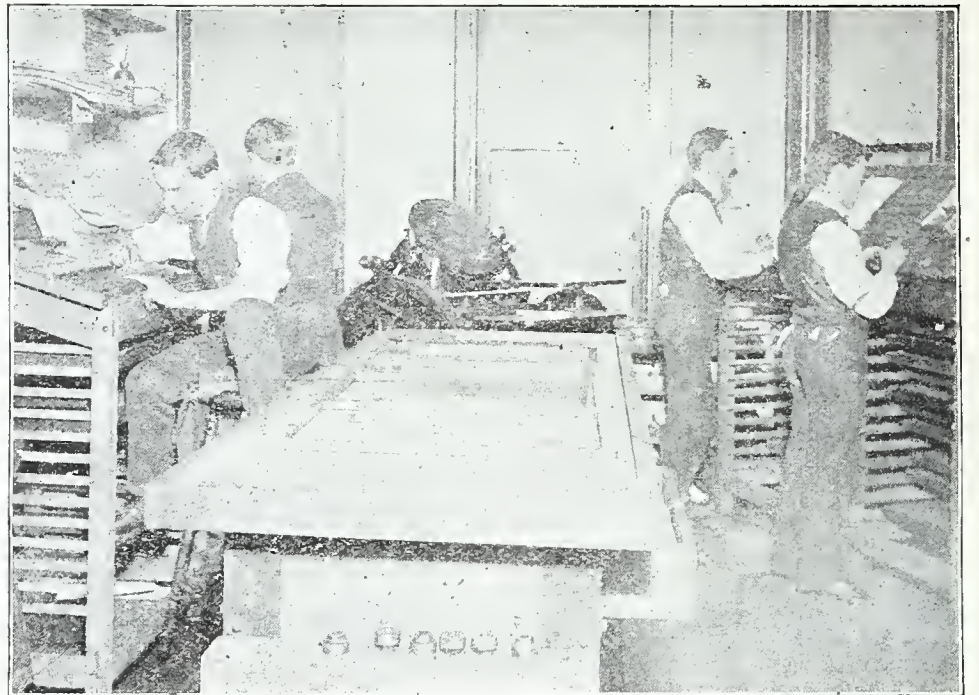
Room 22 is the examination room. Here come all the sketches, photographs, and models that are received at the office for examination as to patentability. The room is occupied by Mr. B. G. Foster and Harold H. Simms, Examiners, and Miss E. M. Shuster, typewriter. Mr. Simms, age 22, is a nephew of Mr. Siggers, and entered the patent soliciting of-

fice of Snow & Siggers in 1894. He is a hard worker and an expert examiner. Mr. Foster, age 23, entered the same office December 23, 1896. He prepares specifications for patent applications, and is making rapid progress in this direction.

Room 23 is occupied by Mr. Louis G. Julihn, specification writer, Mr. E. G. McKee, draftsman, and Miss Mary Warner stenographer, both of the last named being old employees of firm composed of Snow & Siggers. Mr. Julihn age 27 started in the patent business as draftsman in 1888, and later turned his attention to specification writing, at which he has attained great proficiency. Being a close student, a bright future is in store for him.

Room 24 is used for miscellaneous work, typewriting, drafting, and for mailing circulars. It is occupied by Miss M. A. Crook, stenographer, Mr. C. A. Byrne, draftsman, and Miss Carter, clerk.

Room 25 is occupied by J. H. Siggers, chief clerk; Edwin E. Vrooman, model and application clerk; Mrs. F. E. Walter, typewriter; and Miss C. Wood, clerk. Mr. J. H. Siggers, age 30, who for the past fifteen years has held different positions under the old firm, and who for several years previous to the dissolution of the co-partner-



ROOM 28. INVENTIVE AGE COMPOSING ROOM.

conduct of the procuring of patents, and with this he is thoroughly familiar. A well trained and retentive mem-

previous to May 1st, 1899, as well as those who have come to his brother's office since then, will remember the ease with which this ability was brought into play, enabling him in a moment to locate the client's invention and his previous business, as if only one case were handled instead of thousands.

Room 26 is used as a storage room and has not been photographed for this reason.

Room 27 is occupied by Mr. Crittenden Marriott, and Misses K. Wood, Kaldenback, and Van Matre. It is used for the two-fold purpose of an editorial room for THE AGE, as well as the newspaper correspondence division. From this room is sent out the daily matter to different daily and weekly papers throughout the United States, and as Mr. Siggers has over thirty-five hundred papers on his list, this involves considerable expense and close application; but so perfect is his system that he has never missed mailing the matter a single day.

Room 28 is the composing room for the INVENTIVE AGE, and is used also by Mr. Siggers for preparing small circular letters in his business. It is presided over by Chas. B. Green. The number of subordinates varies according to the press of business. At the time of taking the picture there were three.

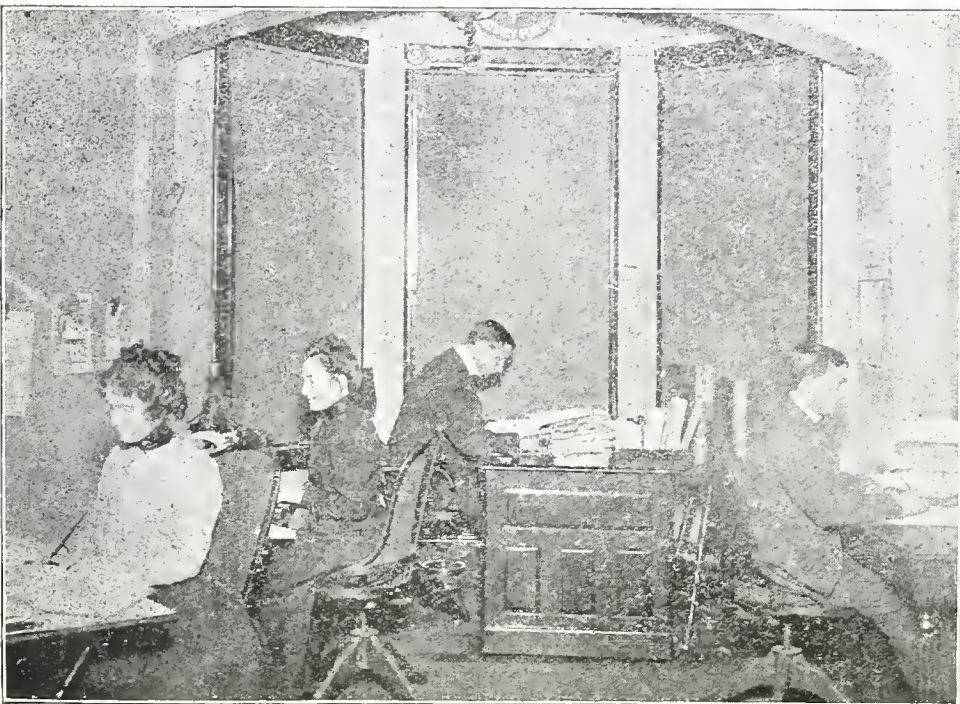
The model-hall connects the suite of rooms, and has been arranged so as to allow ample space for the reception and proper handling of models.



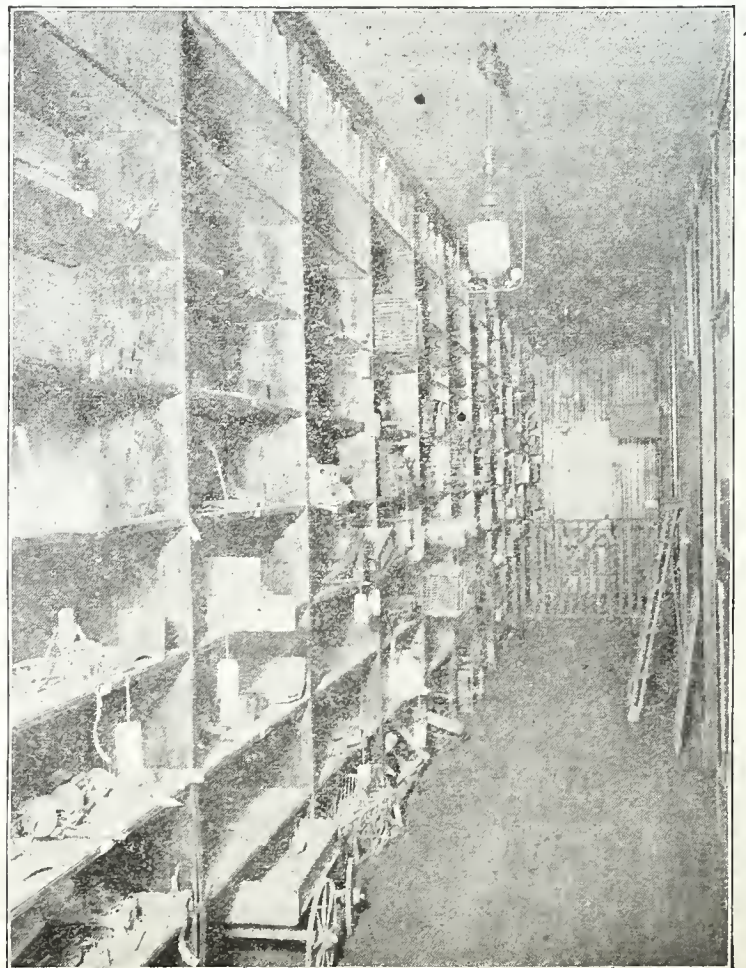
ROOM 27. EDITORIAL ROOM AND NEWSPAPER CORRESPONDENCE DIVISION.

ship between his brother and C. A. Snow, acted as chief clerk of the aforesaid firm, is a resident of the District of Columbia. He attended the public schools of Washington previous to entering the patent business, and has since taken a course in Martyn's College. For ten years Mr. J. H. Siggers has been a Notary Public, in connection with his other duties. Few professions involve the same multiplicity of detail as is essential to the proper

ory is of no small benefit where thousands of inventions and names come into daily use, and many of the inventors, visiting the office of the firm



ROOM 25. MR. J. H. SIGGERS' ROOM.



MODEL HALL, SHOWING ENTRANCE TO SUITE OF ROOMS.



## SOME OF THE CONCERNS REPRESENTED BY E. G. SIGGERS.

The skill and competency of a patent attorney is best shown in the character and standing of his clients, for men of acknowledged position in the manufacturing world do not employ attorneys who have no other stock in trade than their "cheap" terms and "cheaper methods," as they recognize only too well the fact that such legal (?) assistance is dear at any price.

It is a matter of considerable pride to Mr. Siggers that he enrolls among his list of clients men who know what a patent is, and therefore are able to appreciate the first-class patents that are issued through his office each week. We have thought it best to reveal to our readers some of the firms and corporations represented by Mr. Siggers, and this for a two-fold purpose. First, as an object lesson to other inventors to show what vast interests have been built up by the energy and skill of some inventors when coupled with the protective force of patent grants, and, second, as a testimonial to the faithful services of a patent attorney who always looks to the best interests of his clients and works to the same end.

We first draw attention to the Phelps Continuous Can-Making System, which is manufactured jointly by the Imperial Seamer and Manufacturing Co., and Phelps & Co., of 702, 704 and

study and experiment on the part of the inventors, the object in view being to produce a system of manufacturing cans which would be moderate in price, simple to operate and a saving of solder and labor.

The Phelps' Imperial Seamer, was the first part of the system completed by the Messrs Phelps, and has been on the market for three and a half years, the total capacity of the Seamer sold to date, being about half million cans per day. The continuous system was completed about two years ago, the total capacity of the systems sold to date being about 250,000 cans per day, the sales extending throughout the United States, Canada and South Africa.

The operation of this system is as follows,—each article of use in the system is indicated by numbers. The bodies, tops, and bottoms of the cans, being first cut in a separate department, the bodies are first run through the Power Roller (No. 1) and falling into a small box, they are then passed singly through the Seaming machine (No. 2) one man operator, which automatically fluxes, sizes, and solders, and delivers the can body, which rolls from the Seamer to the Heading Table (No. 3) where one boy puts the bottoms on the cans and another boy puts the tops on. The can is then taken by a boy operating the Crimper (No. 4), where the tops and bottoms are securely crimped onto the can body. The can then rolls by

the can to enable them to be properly soldered. The can then arrives at the Power Floater (No. 6) where a boy places the can in a revolving can holder or chuck, which revolves the can in a bath of hot solder against a soldering iron, thus soldering the top end; the boy putting the cans into the machine with the left hand and taking them out with the right hand, sets them down in the table or chute (No. 7) filling the compartments of the chute alternately. As fast as one compartment is filled, he shoves the cans in the other compartment, which have been cooled, to the boy at the other end of the Floater (No. 6), where the operation is repeated to solder the bottom end of the can. The cans are then passed along Chute No. 8 to the Tester, one man operator, where they are passed under hot water with about 25 pounds per square inch pressure in the cap. The can is then complete and finished, the operation being continuous. The capacity, with expert hands, is from 8,000 to 9,000 cans per day.

The inventors of this system, which comprises a series of independent machines working to a common end, are Edwin and Walter J. Phelps. They are natives of Camden, Oneida Co., New York, and came to Baltimore about ten years ago. The first named is a millwright by trade and the latter a practical can maker. They have obtained a number of patents, the last being dated August 18, 1899, and



GEO. R. SCATES.

Another inventor whose name is often found on the records of the Patent Office, is George Randolph Scates. He was born in Knox County, Tennessee, December 21, 1842, on the banks of the Tennessee River, and only a few miles west of what was then known as the Village of Knoxville, but what is now a city of more than fifty thousand.

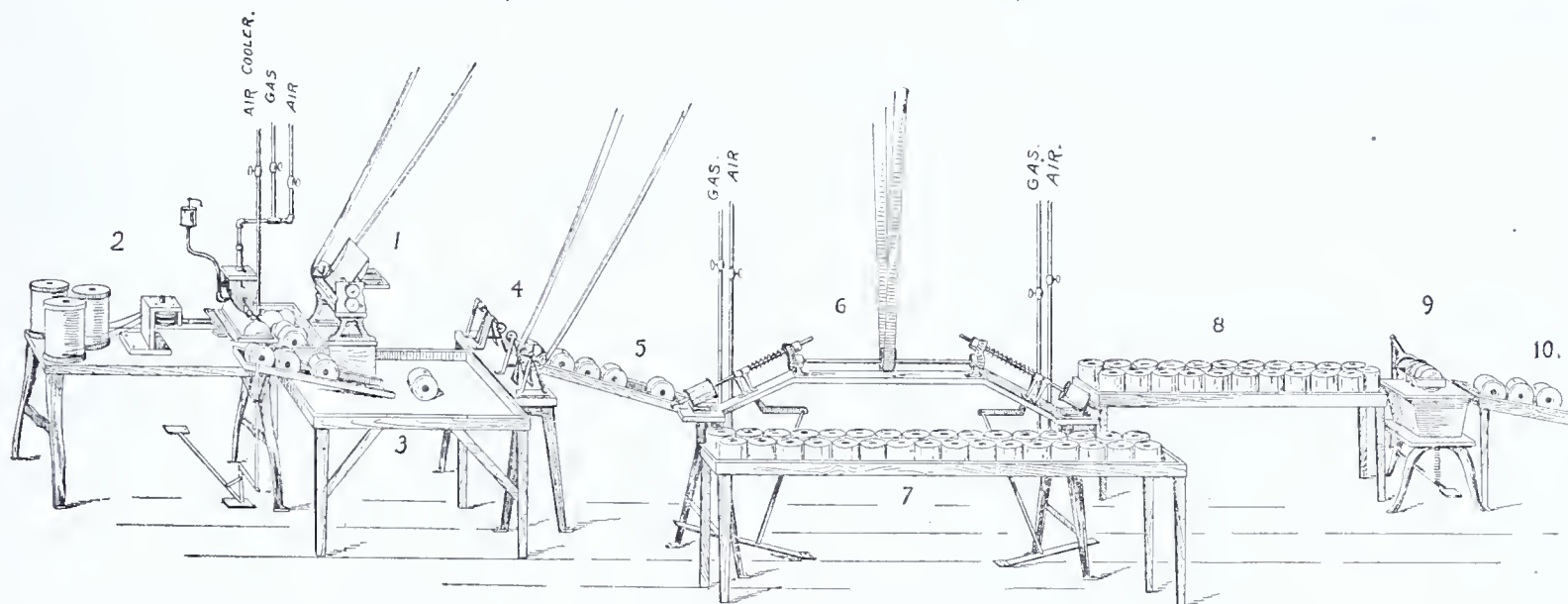
"Geo. R." as he is familiarly known, was especially fortunate in that he came of mechanical stock, his father, grandfather and all his uncles being

thorough and well skilled mechanics of their day, representing the various trades of fine hand carpentry, mill-wrighting, machinery, cabinet work, farm machinery, etc. Some of them also invented many novel and useful things, but unlike Mr. Scates, they usually failed to take the most important and necessary step, viz: to have their inventions patented. Geo. R. in early boyhood days, worked along with his father in the cabinet, carpentry, and mill-wrighting trades, and with astonishing proficiency. At about 18 he learned the silversmith's trade, and later tin and copper smithing and heavy sheet and plate metalwork. At the age of 22 he left his native state, went west, and for a few

years worked in a number of the largest and most important shops and factories of heavy metal machinery in Indianapolis, Chicago, Cincinnati, and Detroit. During all this time he was devoting much of his thought and energy to the matter of new inventions.

He gradually withdrew from the busy shops and turned his attention to the inventive field, and here it can be well said that he found his natural calling. He has, during the last score of years, made and put through the Patent Office, and has now in actual use, fifteen valuable and useful patents, a few of which are the "Spout Former," "Steam Fruit Dryer," and "Dry Air Closet," the latter having been patented through Mr. Siggers, March 13, 1900, No. 645,495.

It must be said, however, that the crowning effort of Mr. Scates' life was the invention of the Scates Steel Warm Air Furnace. This he has had on the market in his own name for the last 15 years, and has placed it very largely in the New England, Middle, Southern, and Western States. Since its



706 Covington Street, Baltimore, Md.  
The Phelps' Continuous Can-Making System, is the result of many years'

gravity down chute (No. 5) collecting as they roll a sufficient amount of flux adjacent to the joint on each end of

numbered 629,918.

Their opinion of the work of Mr. Siggers may be gathered from the following letters of endorsement:

"Baltimore, Md., May 1, 1899.

I have had a number of patents taken out in the past ten years, under the personal supervision of Mr. E. G. Siggers, and think very highly of his ability, and value his advice very much. I have always found him safe and reliable, and can cheerfully recommend him to any one in need of a Patent Attorney.

W. J. Phelps."

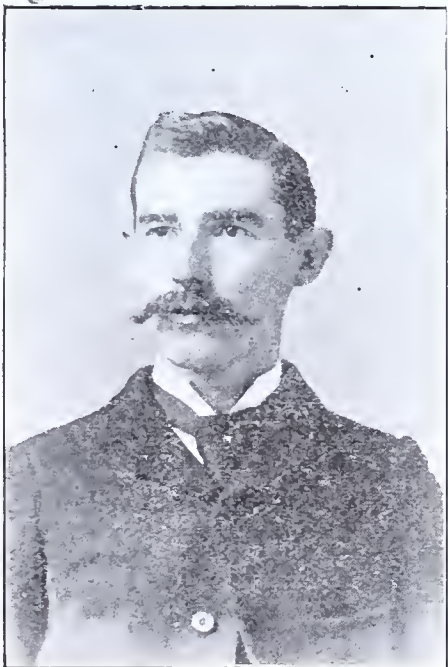
Baltimore, Md., May 3, 1899.

E. G. Siggers, Esq.,  
Washington, D. C.

Dear Sir:

The work you have done for me has been very satisfactory and you may refer when you choose to me. My regard for your ability is such that I would not like to take out a patent now unless it had your personal supervision.

Yours truly,  
Edwin Phelps.



W. J. PHELPS.



EDWIN PHELPS.



first conception, a number of improvements have been made on it, until it stands to-day without an equal in its line of work. The accompanying cut shows the latest improvements.

As Mr. Scates is yet only in middle life, it may be reasonably expected that his field of usefulness as an inventor is not over, notwithstanding

small holes serve the purpose of water wells instead of digging or blasting out a five or six foot hole through the rock. At first the farmers for whom he offered to drill, looked with much distrust on his proposal, and in order to convince them that a four or five inch well would furnish as much water as the large dug wells in use, young

blacksmith and wagon maker and offered him a half interest in his invention if he, the blacksmith, would build the machine. Fortunately for young Downie, the blacksmith had no faith in the scheme and refused to help. Downie then set about it himself, and having found a small engine and boiler in a scrap yard in Pittsburg, he moved them to his father's farm, and under a locust tree in the back yard built a rude machine. However, it proved to be a working proposition and a profitable one from the start.

During the succeeding years, young Downie spent the summer months drilling, and the winters at Geneva College, leaving the business in the hands of his younger brother, John G. At 28 he graduated from Geneva College, having completed its classical course.

The president of the college then proposed the formation of a company for the manufacture of drilling machines under Downie's patents. A small company was formed, R. M. and his brother, J. G. Downie receiving stock for their patents. From this small beginning has grown the Keystone Driller Co., now doing business at Beaver Falls, Pa., and sending its goods all over the world. Mr. Downie was elected Secretary and General Manager of the company at its formation, and has held the position ever since.

Since that time the two brothers have taken out many patents upon improvements. One of these inventions was a traction attachment by which the machines were made to propel themselves over the roads. A fair illustration of one of these machines is shown in the engraving.

An invention in one line paved the way for others. A means of pumping the water from the wells for city

valve which made the two-stroke pump possible. They were made in several sizes and styles, and immediately sprang into favor. The Downie Pump Co. was organized in 1893, and its foundries and factories located on the old home farm at Downieville, Butler County, Pa.

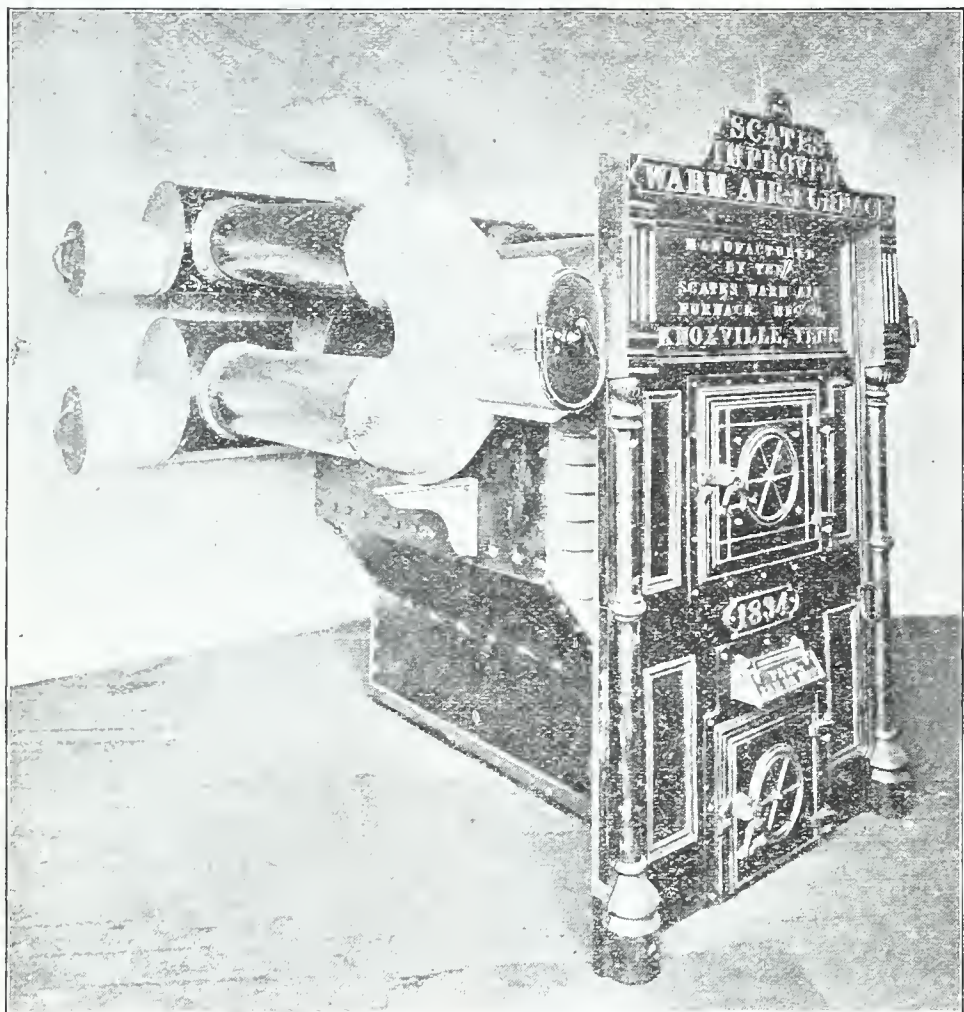
J. G. Downie, the principal inventor in the pump line, was made superintendent and general manager. There are many styles of the two-stroke pump now made by this successful company, and car loads of them are shipped away from the farm on which the two brothers used to wield the grubbing hoe and follow the plow.

The latest patent in the pump line obtained for Mr. Downie by Mr. Siggers, was that issued December 12, 1899, No. 639,155. It is a dredging pump and is designed to extract from the bottoms of bored or drilled wells any mineral or heavy substance.

Robert J. Fisher, the inventor of the Fisher Book Typewriter, which is creating a revolution in the art of typewriting and of keeping books, was born in Athens, Tennessee, where he received a collegiate education, graduating with highest honors in a class of 150 students.

At the age of fifteen he entered a mercantile establishment in his native town, where he was employed as clerk and salesman for about five years, and then accepted the position of teller in the Cleveland National Bank, Cleveland, Tenn. After occupying this position for four years, Mr. Fisher returned to Athens, Tenn., and organized the First National Bank of Athens, becoming its cashier and serving in this capacity for a period of thirteen years.

It was while acting as cashier of the Athens bank that Mr. Fisher's thoughts turned to the invention of a book typewriting machine—one that would not only be capable of writing on the pages of bound books, but necessarily adapted, for commercial success, to do all the work performed by the ordinary machine, such as



that a very large portion of his time is taken up as superintendent of the Scates Warm Air Furnace Company, with its factory and main office at Knoxville, Tenn.

Downie had to guarantee the little wells for a year. This warranty brought custom and success. But the rock was hard, and with two stout helpers only four or five feet per day could be drill-



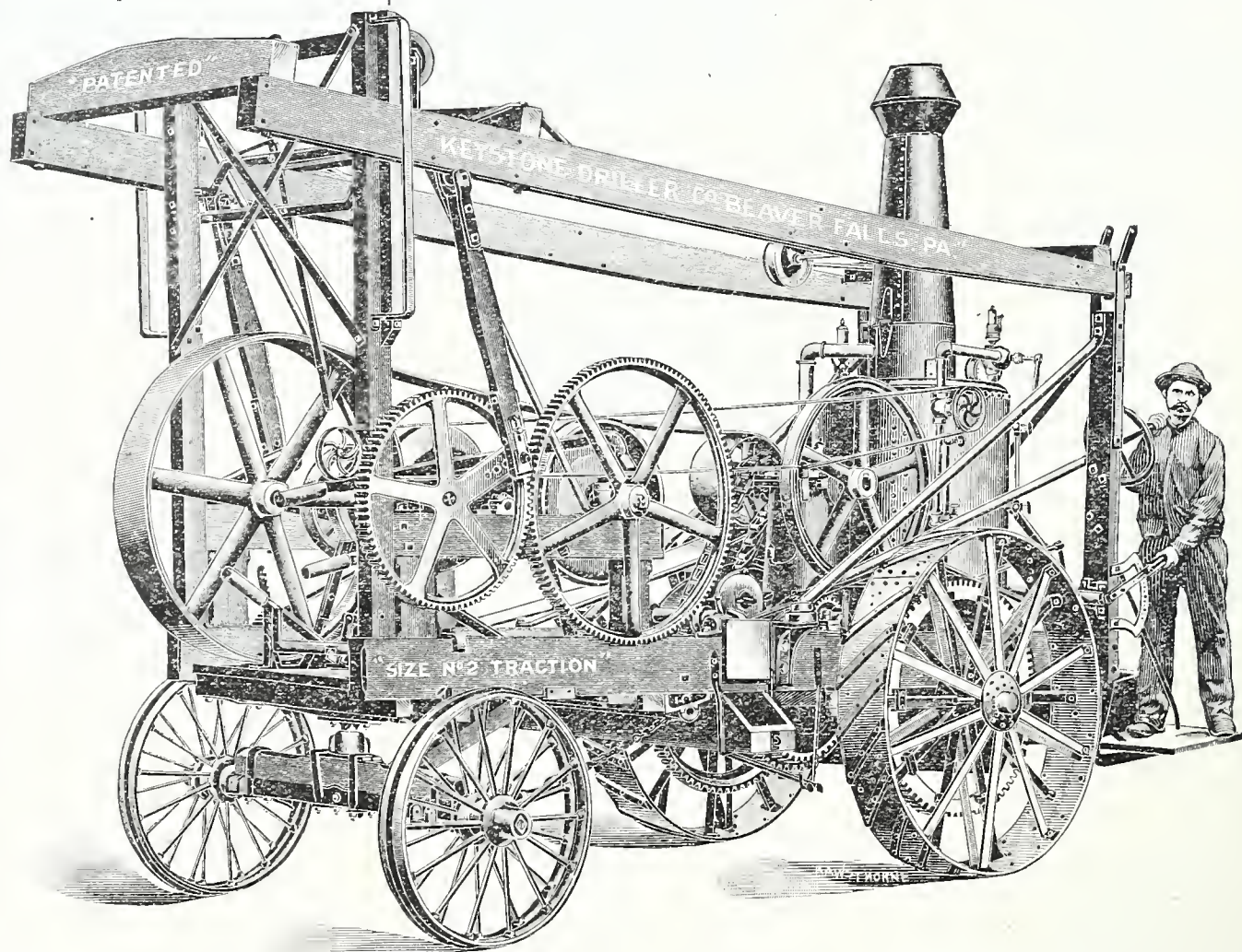
R. M. DOWNIE.

Robert M. Downie was born Aug. 12, 1853, and spent his boyhood on his father's farm in Butler county, Pennsylvania. At 21 he set out with a fair common school education as his stock in trade, and engaged in drilling prospect holes for coal with a set of handpower spring-pole tools of his own construction. While at this he conceived the idea of making these

ed, and the profits were small. It was while laboriously doing this work that the idea occurred to him of applying steam power. Having little money, he took his plans to a neighboring

and factory uses was lacking. So in 1887 the two Downie brothers turned their attention to artesian well pumps, and after a series of experiments invented the now famous conical pump

writing on loose sheets, cards and envelopes. Once started, the fascination and interest in the project and in the development of the plans occupied his attention night and day. While





having had no previous practical experience in mechanics, there was evidently extraordinary latent power in that direction, as was proven by subsequent events, and the conception of the invention of a book typewriter was the spark that set his genius aflame. His own lack of actual, practical experience in the mechanical line, and the limited facilities then offered in his native town for availing himself of the ability and experience of skilled mechanics, made the problem an unusually difficult one. In spite of these draw-backs, the first crude model was constructed in a way simply to demonstrate the basic principles of the machine. The building of several succeeding working models was necessary before the successful plan of building a practical book typewriter was solved. It was not only essential, for the practicability of such a machine, that it be capable of merely writing on the pages of books, but that it should be done in a manner convenient to the operator, and on a plan that would permit the writing to be seen and erasures and corrections to be easily made.

The work done with a book or record typewriter, differing from that by the ordinary correspondence machine, is intended to stand for ages; must be absolutely perfect in detail and free from any and all errors—hence the need for exposing the writing surface and the view of the work, above mentioned.

The working out of certain important and vitally essential details, necessitated the entire re-planning of the machine after several models had been built. One of the most important of these details was the placing of two types on one arm, so as to hang the arms within a limited range, in order that the writing surface could be viewed while the work was being done. Both type striking in the same plane, the problem involved the shifting of the type in a way that one would be out of position while the other was printing, and both be in perfect alignment while the work was being done. This problem Mr. Fisher solved in a most ingenious way, and one that has been recognized to the extent that it has but recently brought him the John Scott Legacy Medal from the Franklin Institute of Philadelphia, before which Mr. Fisher was requested to appear more than a year ago.

After all this preliminary work had been accomplished, covering a period of several years and most constant and persistent attention, a corporation was formed, under the laws of Tennessee, with a capital of \$250,000, and a factory started at Athens, Tenn., for the building of machines. A capable superintendent was employed; mechanics and tool makers selected with great care, and the building of

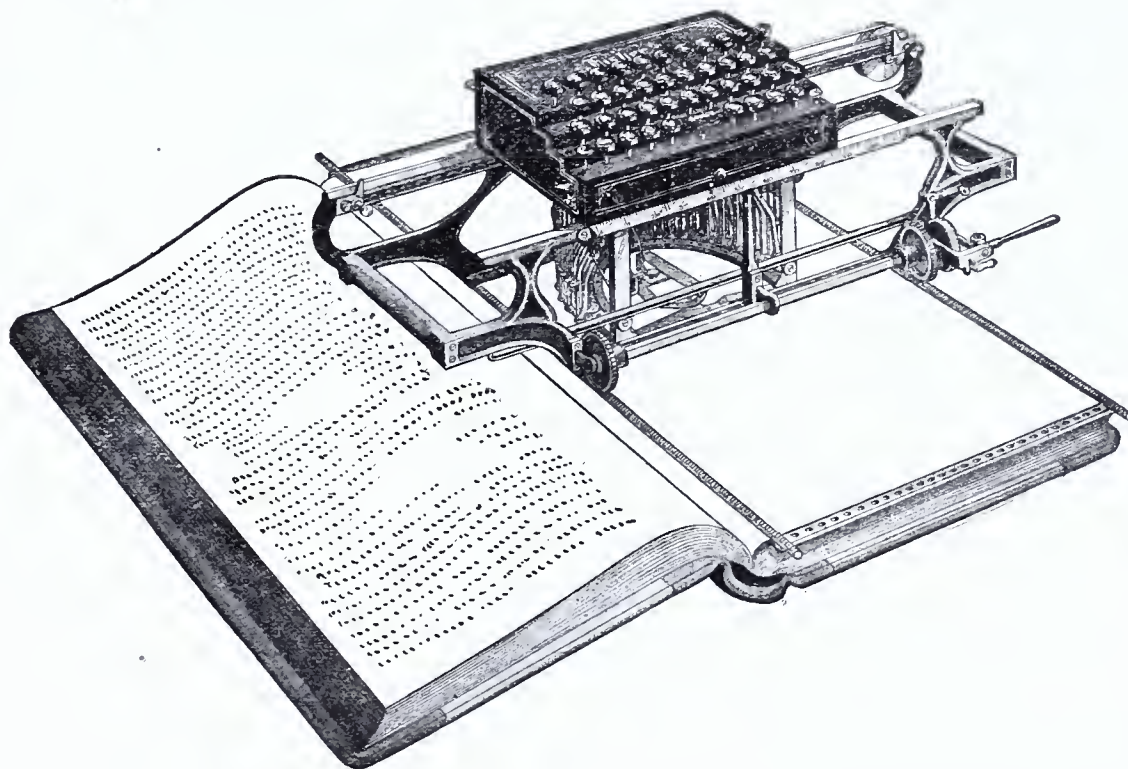


ROBERT J. FISHER.

in fact necessary to establish the machines as a first-class commercial product, necessitated the building of tools so perfect and so accurate that they should not vary one-thousandth of an inch in the operations which they perform. They are as delicate in their adjustments as the tools required for the building of the finest watches. The very first machines manufactured, while entirely correct and practically perfect in their plan, showed certain improvements possible in the construction, and it was deemed advisable to make the necessary changes before actively and extensively pushing the product, rather

tails of construction as the very best makes of letter typewriters. The patience, pains-taking care and skill shown by Mr. Fisher during this long and tedious process of model making, tool making and building of machines all done under his general direction, stamps him, not as an inventor of the ordinary type, but as one of the few men who have the ability to invent without having lost that fine balance that makes them successful in whatever venture they may undertake.

After a further delay of about one year, required to correct some of the mechanical weaknesses that had developed in the machine, a new lot was



then turn out a machine that, while thoroughly answering the purposes for which it was originally intended, might not be as perfect in all its de-

put on the market, and these have been in constant use now for more than three years, with a success that has only been measured by the ability

of the factory to turn out the machines.

Mr. Fisher will be ranked as one of the pioneer inventors who has produced a machine that is revolutionizing not only the system of making records in the offices of City, State, County and Government officials, but in the commercial field as well, and stands out with particular prominence in having successfully accomplished that which so many have undertaken and in which they have failed. The patents covering the machine are broad and basic in their nature and very numerous, covering all the features, devices and details of the machine, many of which are so ingenious and novel that, in the prosecution of the applications in the Patent Office, no references have been cited against them.

The growth of the business of the Company has necessitated its removal to a point where better manufacturing facilities could be obtained, and within the past month the Fisher Typewriter Company, of which Mr. Fisher is Vice-President and active in its management, has installed a new plant at Cleveland, Ohio. This city has been selected because of the special features which it offers for turning out a perfect product, and for the convenience of obtaining raw material and shipping the manufactured article. It is the city that has produced the Lick telescope, the home of some of the United States most prominent and largest manufactories along the lines of metal work, such as sewing machines, bicycles, screws, nails, lathes, presses, manufacturing machinery, as well as other finished products.

Mr. Fisher's is a rare case—in which the inventor, who has conceived the original idea, has had the ability, the pluck, and the patience to see it through to a successful issue and to reap the benefits of the success.

When Mr. Fisher heard of the contemplated dissolution of the co-partnership between C. A. Snow and E. G. Siggers, he wrote the latter the following letter:

Fisher Typewriter Co.,  
Athens, Tenn., and  
346 Broadway, New York City.  
April 17, 1899.

Mr. E. G. Siggers.

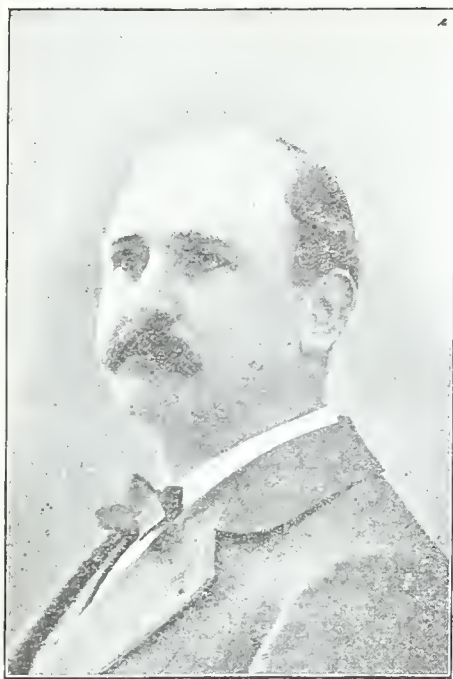
Dear Sir:—I desire to say that my patent business, which you have personally looked after for the past six years, while you were in partnership with C. A. Snow, which business involved the prosecution of quite a number of domestic and foreign applications, has been very satisfactory to me.

I am pleased with both the ability and interest you have manifested in connection with my business with you.

Yours truly,  
Robert J. Fisher,  
President.

Since Mr. Siggers has been in business for himself, Mr. Fisher as well as the Fisher Typewriter Co. have filed through him a large number of applications for United States and foreign patents, all of which receive the most careful and painstaking attention.





ALVIN F. FLOREY.

Alvin F. Florey is the general superintendent of the Cornish Piano and Organ Works, at Washington, New Jersey, one of the largest and most widely known concerns of its kind in the country. It is the only firm of actual manufacturers selling pianos and organs to the public exclusively, direct from the factory at guaranteed wholesale cost.

Mr. Florey is an unpretentious and unassuming inventive genius, thoroughly devoted to the work under his supervision. He has been in Cornish & Co's. employ for the past 18 years, during which time he has invented a number of devices of real commercial value, but he never vended one of them, always having the patents issued in the names of his employers by complimentary assignment—which by the way, in the case of appreciative employers, is only another way of "marketing" inventive genius.

Mr. Siggers has secured a number of patents for Mr. Florey. The accompanying cuts show one of his latest inventions—one that has brought the Cornish piano into special prominence—an instrumental attachment by means of which the tone of a piano is modified to various degrees, imitating other stringed instruments, such as the mandolin, guitar, zither, banjo, etc.

In the embodiment of the invention there is employed a single tongue-bar 1, held in place by suitable guides for vertical movement approximately parallel with the strings 2 of the instrument, and provided with striking tongues 3, depending from the bar and adapted to be arranged, respectively, in the paths of the hammers 4, as clearly shown in Figures 2 and 4, inclusive. Connected with opposite ends of the tongue-bar are push-bars 5 mounted in guides 6 and connected at their lower extremities to levers 7 and 8, having their inner ends connected by a suitable sliding joint to insure co-operative movement thereof. The pedals 7<sup>a</sup> and 8<sup>a</sup> are arranged, respectively, in operative relation with the inner end of the levers 7 and 8 to elevate said inner ends, and thereby depress their outer ends to draw downwardly upon the bars 5.

The tongues 3, one of which is employed for each hammer 4, are constructed of felt, and are provided at their lower extremities and at those sides contiguous to the strings 2 with hard striking surfaces 9. In connection with the striking tongues there is employed a muffler-strip 10, of felt, which is arranged between the tongues and the plane of the instrument-strings, and preferably depends to a point approximately midway between the upper and lower edges of the striking surfaces of said tongues. The advantage of arranging the muffler-strip upon the tongue-bar, which supports the striking tongues 3, is that a single adjusting mechanism may be used for accomplishing the production of either a mandolin or tinkling tone and the muffled tone peculiar to the interposition of a muffler strip between the hammers 4 and the instrument-strings. Only a difference in position of the tongue-bar is necessary to vary the character of the tone, as described. For instance, when the tongue-bar is lowered to bring the faced extremities of the tongues in the paths of the hammers, as shown in Figure 3, the contact of a hammer with a tongue carries it, with the muffler-strip, into contact with the string, only the lower edge of the striking-surface of the tongue contacting with the string, owing to the fact that the upper edge of the said face is spaced from the string by the contiguous, overlapping edge of the muffler-strip. The contact of the muffler-strip deadens the ordinary tone of the string, while, the edge contact of the tongue-

face produces the light, semi-metallic string tone having the general characteristics of mandolin, harp, zither, and analogous tones. On the other hand, by still further lowering the tongue-bar to bring the body portions of the tongues into the paths of the hammers, above the striking faces of said tongues, the operation of a hammer drives the tongue and muffler-strip toward the strings of the instrument, but only the muffler strip comes in contact therewith, the striking face of the tongue being thrown backwardly and held out of contact with the strings by the overlapping lower edge of the strip, as shown clearly in Figure 4. Thus, when it is desired to produce the mandolin tone the operating pedal 7<sup>a</sup> should be operated to depress the tongue-bar sufficiently to bring the striking-faces of the tongues into the paths of the hammers, as shown in Figure 3; whereas in order to produce the muffled tone due wholly to the contact of the muffler-strip with the strings, the other, or practice, pedal 8<sup>a</sup> should be operated to impart a double-step movement to the tongue-bar, and thus depress it sufficiently to bring the tongues at points above their striking-faces into the paths of the hammers, as shown in Figure 4.

#### SPECIAL NOTICE.

THE AGE proposes to make a special feature of these biographical articles concerning prominent inventors and their inventions. Several very important articles were crowded out of this number owing to lack of space. They will appear in succeeding issues. WATCH FOR THEM.—A study of the methods of work of successful inventors may enable you, in turn, to achieve success.

#### A Broad Patent On A Wonderful Invention.

A patent which has recently been issued, (No. 645,856), has attracted considerable attention and is destined soon to find a purchaser in someone of the great ship building concerns of the country. The name and address of the patentee are A. B. Kokernot, 1521 S. Liberty St., New Orleans, La.

The essential feature of the invention resides in the application to the blade or fluke of a screw propeller, of a cushion or tire 3, which extends around and bounds the outer edge of the blade and is disposed on the rear or active surface thereof. One of such cushions is employed for each blade, and consists of a hollow, inflatable sack composed of flexible material which will yield to the resistance offered by the water under the rapid rotation of the propeller. The material of the cushion may consist of rubber or of textile material, or a combination of both, the essential idea being that the cushion or tire be flexible throughout. The cushion is also of the greatest cross-sectional area at its central portion, and it tapers therefrom to the opposite extremities, which are contracted or reduced, as shown at 4, the said extremities being provided with metal sleeves 5, which, if desired, may be equipped with other sleeves or couplings 6, adapting the terminal portions of the cushion to be connected with pipes leading to a reflex bellows.

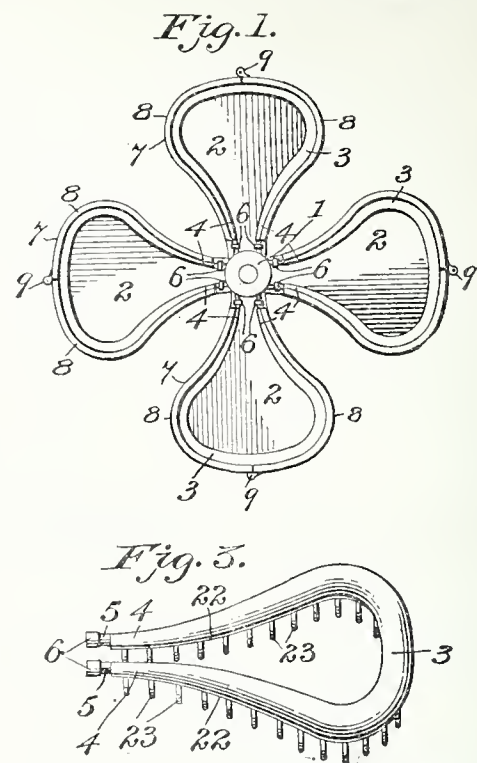
The claims accompanying the patent are as follows:

1 A screw-propeller having an inflatable cushion on its active surface, as and for the purposes described.

2 A screw-propeller having its active surface provided with a pneumatic cushion surface, as and for the purposes described.

3 A screw-propeller provided along an edge thereof with an inflatable cushion-surface, substantially as and for the purposes described.

4 A propeller blade provided with a continuous inflatable cushion along



the active edge thereof, substantially scribed.

5 A screw propeller provided on its active surface with a governable or adjustable inflatable cushion, substantially as described.

6 A propeller blade having a cushion along its active edge, substantially as described.

7 A propeller having an inflatable cushion on its active surface, in combination with a reflex air device in communication therewith, substantially as described.

8 A propeller having an inflatable cushion on its active surface, in combination with a pair of reflex bellows communicating therewith substantially as described.

9 The combination with the blades of a propeller, of cushions on the active faces thereof, and an independent reflex bellows for each cushion, substantially as described.

10 The combination with the blades of a propeller, of air-cushions thereon, a driving-shaft on which the propeller is mounted, and reflex bellows mounted on said shaft, and communicating with the cushions, substantially as described.

11 The combination with the blades of a propeller, of air-cushions thereon, a driving shaft, independent pipes for the respective cushions, extending longitudinally of said shaft, and inflating-valves connected with said pipes, substantially as described.

12 A propeller, and a yielding cushion on the active side thereof, in combination with attaching means for securing the cushion to the propeller, substantially as described.

13 A propeller, and a yielding cushion on the active side thereof, in combination with a cushion encircling frame for binding the cushion against the propeller and holding it thereon, substantially as described.

14 A propeller, and a yielding cushion on the active side thereof, in combination with a driving shaft, and a series of pipes located in longitudinal recesses in the shaft and communicating with the cushions, and having inflating means, substantially as described.

15 A propeller, and a yielding cushion on the active side thereof, in combination with a driving shaft, pipes leading to said cushions, and arranged in grooved seats extending longitudinally of the shaft, and retaining means surrounding the shaft and engaging the pipes, substantially as described.

16 A propeller and a yielding air-cushion on the active side thereof, in combination with a driving-shaft, a pipe leading to the cushion and arranged in a grooved longitudinal seat in the shaft, a retaining collar encircling the shaft and engaging the said pipe, and a pair of reflex bellows mounted on the shaft and communicating with

(Continued on page 19)

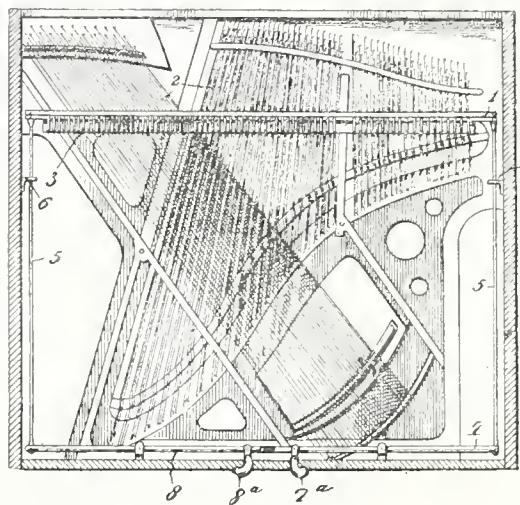
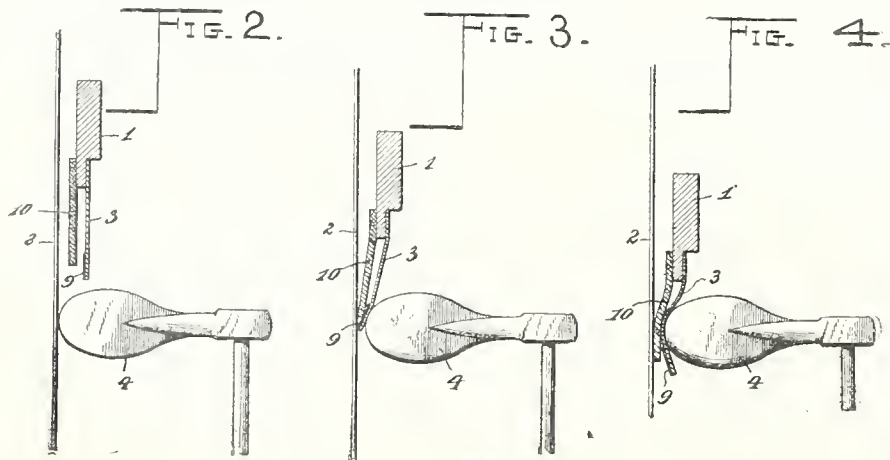


FIG. 2.

FIG. 3.

FIG. 4.





**[AN EXPERT'S OPINION.]**

What a Prominent Attorney Thinks of  
the Bill to Provide for Lessening  
the Number of Appeals in  
Applications for  
Patents.

It is a fact well recognized that there are too many appeals in the Patent Office. It is also a fact that the decisions of the Board are not considered binding upon the Examiners, except in the individual cases considered by them. The reason for this is that the decisions of the Board are not final, and, further, that its decisions are not published and consequently do not come before the notice of the Examiners who are not interested in the particular case reviewed. The Board, however, is a desirable tribunal because it represents the conservative thought of the Office and its personnel is made up of men who have had years of special training for the determination of such questions as are presented to it on appeal. The tenure of office of the members of the Board is not affected by changes of administration, and its decisions are uniform except in so far as they are necessarily modified by the decisions of the Commissioner. Unfortunately the necessity for such modification is frequent because the term of the Commissioner is brief and each Commissioner has his individual idea and is empowered to change at will the practice of the Office in accordance with his views. For this reason, the practice of the Office varies constantly, as evidenced by the radical changes made by Commissioner

Seymour, despite the wide variance of his views with those entertained by the best intelligence of the examining corps and the profession generally, and further evidenced by the restoration of the previous practice by Commissioner Butterworth, and more recently by radical changes inaugurated by the present Commissioner. It is undoubtedly desirable to make the practice of the Office uniform, and it is also desirable to reduce the number of appeals in order to expediate the adjudication particularly of contested cases. The question is as to how this can be accomplished.

The Commissioner, in his annual report, proposes to abolish the Board and to substitute a Board composed of three Assistant Commissioners, who, together with the Commissioner, shall hear all appeals from the Primary Examiner and Examiner of Interferences. It seems to me that such a change would not accomplish the desired end, first, because this embodies a reduction of the present examining corps by one, and it is doubtful whether such a Board could consider the large number of appeals from the Examiners and the Examiner of Interferences; second, because the Commissioner would still have complete jurisdiction over the practice of the Office, and because the weight of his opinion would be equivalent to more than one vote of the Board of which he would be a member; third because the questions of practice and merit are so intimately interwoven that in some cases, at least, the Commissioner, as member of the Board, would consider questions of

merit respecting which he would at least have indicated his views while passing upon questions of practice; and finally, because the Commissioner of Patents would have the power, as at present, to grant or refuse a patent notwithstanding the decisions of this Appellate Tribunal.

It is difficult to see what advantage to the patent system could accrue from such an anomalous condition of affairs. In my opinion, the first step which should be taken for the reorganization of the Patent Office should be its absolute removal from political interference. The one man power should be abolished, and in its place there should be established a tribunal composed of not less than five judges, having equal weight and authority, and organized substantially in the manner of the Court of Appeals, that is to say, by making one of the Judges President of the Court, or Chief Commissioner if you please, whose duties, in addition to that of a judge, would be to perform those purely executive functions necessary to the conduct of the Office. The term of office of this Board should be during good behavior and adequate salaries should be paid to insure the retention of the highest order of legal and scientific ability. Under such circumstances, the practice of the Office would be made uniform, and the decisions would be based upon the conclusions of a Board of competent men who would be beyond the reach of political or other extraneous consideration, and whose decisions would be published and of binding force upon the Office.

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Wheel.....E. Olund et al  
Wheels. Making.....G. W. French  
Whiffletree attachment.....R. Klatt  
Whiffletree hook and clip.....G. N. Schindel et al  
Wick.....J. B. I. Juhl  
Wind instrument mouthpiece.....F. Munch  
Windmill.....O. F. Scott  
Wire stretcher.....I. M. Warner  
Wires. Supporting overground.....C. Kronenberg  
Wrench.....A. Meyer  
Wrench.....B. Shaw  
X-ray apparatus.....R. A. Fessenden  
Yarn. Apparatus for the quantitative determination of moisture in.....W. D. Hartshorne  
Yeast. Making extracts from.....R. Ruckforth  
Yoke attachment. Neck.....I. L. Baker  
Zinc chlorid. Making anhydrous.....O. J. Steinhart et al

Canadian Patents may now be obtained by the inventors for any of the inventions named in the foregoing list, provided they are simple, at a cost of \$30 each. If complicated the cost will be a little more. For full instructions address E. G. Siggers, 918 F Street, N. W., Washington, D. C. Other foreign patents may also be obtained.

## A Broad Patent on a Wonderful Invention.

(Continued from page 14.)

said pipe, substantially as described.

17 A propeller, and a yielding cushion on the active side thereof, in combination with a driving-shaft, a pipe leading to the cushion and extending longitudinally of the shaft, a pair of bellows mounted on the shaft and communicating with said pipe, and an indicator attached to and actuated by the bellows, substantially as described.

18 A propeller having a hollow hub, and a yielding cushion on the active side thereof, in combination with a driving-shaft, a pipe extending longitudinally of the shaft, a reflex air device connected thereto, and a coupling within the hollow hub of the propeller connecting the pipe and cushion, substantially as described.

19 The combination with a propeller-blade, of a flexible air-cushion thereon, means for inflating said cushion, and springs for expanding the cushion, substantially as described.

20 The combination with a propeller-blade, of a flexible air-cushion mounted thereon, and circular springs extending circumferentially of the cushion for expanding the latter, substantially as described.

21 The combination with a propeller-blade, of a cushion extending around the edge thereof and having its extremities arranged adjacent to the propeller-hub, and an inflating-pipe extending into the hub, where it is branched and connected to the terminal portions of the cushion, substantially as described.

22 The combination with a propeller-blade, and a flexible air-cushion thereon, of a driving-shaft, a collar thereon having an internally threaded eye, an exteriorly-threaded pair of reflex bellows screwed into said eye, a flange on said bellows adapted to be fastened to the eye, and a pipe leading from the bellows to the cushion, substantially as described.

This patent was procured through the patent soliciting department of E. G. Siggers who naturally takes great pride in obtaining the series of broad claims which fully cover the meritorious features of the invention. This desirable result was secured by the personal efforts of Mr. Siggers, and he pledges to all his clients the same unremitting care and attention to any business entrusted to him. Realizing as he does that the best foundation for a patent business is the obtaining of valid, broad patents, Mr. Siggers will resort to every honorable means to attain this end, hoping thereby to earn the just reward that comes from faithful service.



## SPECIAL SUBSCRIPTION OFFER.

## THE POST FOUNTAIN PEN

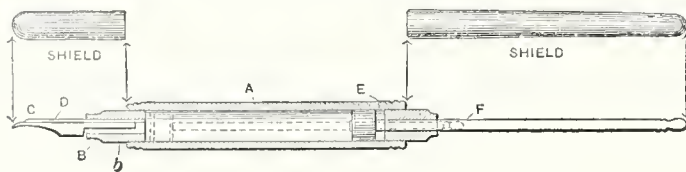
WITH THE INVENTIVE AGE FOR ONE YEAR FOR \$2.50.

At last a reliable fountain pen appears to have been invented. An inferior fountain pen is a nuisance, but a good one is a joy forever. The Post Fountain Pen, as will be seen by the diagrams below, is a SELF FILLER and a SELF-CLEANER, two points which place it far ahead of all others on the market. The patentee has fixed the retail price at \$3, and makes a hard and fast agreement with the trade and agents that \$3 shall be its minimum price. By a special agreement, we are able to offer the Post Pen with the Inventive Age for one year, for \$2.50. The Pen will be sent, carefully packed, to your address, or any other address you send us, with full instructions, prepaid. The subscription price of the Inventive Age is \$1, you practically get the Pen for \$1.50.

The "Post" is the King of Pens.



IT IS AWAY AHEAD OF ANY OTHER PEN MANUFACTURED BECAUSE OF ITS SELF-FILLING AND SELF-CLEANING FEATURES, BEING THE ONLY ONE MANUFACTURED HAVING THESE CONVENIENCES. The simplicity of its construction can be seen from the following diagram.



There are many pens on the market, some have been sold for years and are very popular, but we venture to say that all the pens manufactured together have not such a list of recommendations as the "Post" has secured in a few months. We have testimonials that a million dollars could not buy. In the list will be found Leading Men in Politics, Finance, Law, Religious Movements, Literary Men, Bankers and Business Men. Men who have never before allowed their names to be used in this way have not hesitated to recommend the "Post" and in terms of praise simply unqualified.

The following testimonials are selected from hundreds like them. Send for a more extended list.

The world's greatest singing evangelist, who has thrilled thousands and tens of thousands, now raises his voice in praise of the "Post Fountain Pen."

Mr. Sankey sends the following characteristic letter:

"I have used the 'Post' pen for some time and have had great satisfaction with its use. It never frills or gets cranky. One can at least have clean hands by using the 'Post,' whatever the heart may be."



A recommendation from former Governor, the late Hon. Roswell P. Flower, was worth a great deal, and we value very highly the accompanying testimonial which he sent us a short time before his death:

"This is written with the 'Post,' a new fountain pen, the simplest and best I have ever seen."



General Lew Wallace, the author of the greatest book of the age, "Ben Hur," also "Prince of India," "Commodus," etc., says in a letter in his own hand writing:

"The fountain pen, Post, was received, and I have taken the liberty of trying it thoroughly."

Please accept the excuse for failure to acknowledge sooner. I have tried every pen of the kind on the market, and now unhesitatingly give the preference to the Post. It not only feeds itself with less care but has the immeasurable advantage of resupplying without inking the fingers. I do all my work with it."



Bishop Vincent, author of "The Church at Home," etc., etc., carries a number of fountain pens. Note what he says of the "Post" in comparison with the best.

"The pen is all you promised. I carry four fountain pens, and now the 'Post' makes the fifth, and the fifth is by far the best I have—and all are good."



*Frank Sankey*

*Roswell P. Flower*

*Lew Wallace*

*J. H. Vincent*

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AND SCIENTIFIC PROGRESS.

Twelfth Year. }  
No. 6.

WASHINGTON, D. C.--JUNE, 1900.

Single Copies 10 Cents.  
One Dollar a Year.

## U. S. PATENT OFFICE.

### DIVISION X.

**Carriages and Wagons: A Most Popular Division. The Public is Always Making a Fad of One of its Classes.**

Considerable difficulty is always found in tracing the development of

any particular division of the Patent Office. In the course of time, classes have been transferred and retransferred and transferred again from one division to another, and in many cases, sub-classes have been rapidly enlarged until they have come to monopolize whole divisions by themselves. One of the older classes in the office was that of "Land Conveyances." As far back as 1850 it existed as Class X, and comprised "carriages, cars, and other vehicles used on roads, and parts thereof." In the same division with it were articles used in civil engineering. In 1872, the latter was transferred elsewhere and the division of Carriages and Wagons was formed. Later still, the great class of velocipedes (including bicycles) was cut off and transferred to the division of "Harvesters," where it soon became

the whole division, expelling harvesters altogether. Another great class was cut off about the same time and started an independent existence as "Railway Cars." This left Division X as it now is, comprising all carriages and wagons except bicycles and railway cars, and all devices used in connection with them.

Division X may be called the "fad"

division. That is to say, some one or other of its sub-classes has nearly always been a special fad with the public, and has enjoyed a boom of more or less extent. For instance bicycles were a mere sub-class of the Division, when in 1875, the old high front wheel machines began to be imported in large numbers from Great Britain. When the safeties were invented, the work grew so heavy that the class could no longer be examined in the

but although a great many patents have been issued on these, it cannot be said that the advance has as yet been very marked. The art is still largely in an experimental stage. Whether it will wax until motor vehicles become a separate division, or whether it will wane until they become as little considered as the once-prevalent two wheeled carts, the future alone can tell.

One very up-to-date sub class is that of "Klondike Runners." Experiment

will work anywhere else, and especially whether they can be made strong enough and yet light enough to stand the work they must do, has not yet been demonstrated.

Another class which has become very important includes pneumatic tires and hubs. The pneumatic tire is an old invention but it was little used until 1888, when it came in connection with bicycles and has been still further developed to meet the

needs of automobiles and other vehicles. A very large number of patents have been issued for these. Another class on which there has been a great run is that of car couplings, which have been favorites with inventors for more than twenty years. The laws of various states, compelling the adoption of safety devices, have stimulated this powerfully, and the recent act of Congress requiring them to be used on all railroads doing an interstate business has still further caused action in this line.

It is of course impossible even to note the names of the 116 sub-classes included in the Division. Some of them, it is true, do not have an application once in ten years, but others have many and many a one. During the year 1899 there were a total of 1,614 applications distributed amongst them.



DIVISION X, UNITED STATES PATENT OFFICE.

division, and as has been said, was transferred elsewhere.

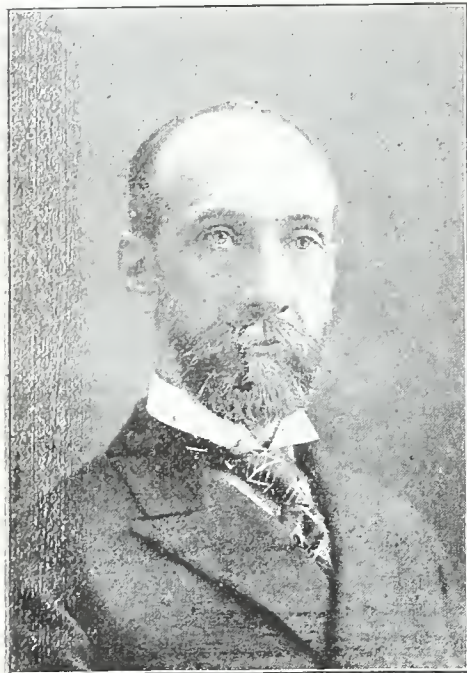
Another fad, long since forgotten, was for two wheeled carts. Between 1880 and 1890 there were over 700 patents issued for these, while in 1899 only 3 were granted. The fever has run its course, which is more than can be said of bicycles,

At present automobiles set the pace,

in this line was suggested by the Secretary of War a few years ago and about a hundred vehicles for the purpose have been patented. All of them are more or less amphibious. They have wheels for the ground, runners for snow and ice, and keels for cleaving the waters of the Alaskan streams. Some of them are very ingenious on paper, but whether they

Henry P. Sanders, principal examiner of Division X, was first appointed a temporary clerk May 15, 1867 and was placed on the permanent roll on July 6, 1869. He was afterwards promoted by successive competitive examinations to Second Assistant Examiner, and First Assistant Examiner, attaining his present position on May 13, 1875, when he took charge of the class





HENRY P. SANDERS.

of Land Conveyances and has continued in charge to the present time. He studied law and was admitted to the bar of the Supreme Court of the District of Columbia in 1870. He was a member of the Board of Special Civil Service Examiners in and for the Patent Office from 1886 to 1892.

F. W. Holt, First Assistant Examiner, was graduated from the University of Wisconsin as a civil engineer. He entered the Patent office in 1886 and was steadily promoted after examinations until he reached his present place. He has had a wide experience in patent work, having served in Division IV and V as well as in Division X. He was graduated from the Law School of the Columbian University in 1888 and took a post graduate course the next year.

T. H. Mitchell, of Tennessee, is the Second Assistant Examiner of the Division. He entered it as a copyist in 1881 and has remained with it through successive promotions ever since. His specialty is bicycles and motor vehicles. He is a graduate of the University of Tennessee.

G. V. Chandler, the Third Assistant Examiner, has two degrees, those of Bachelor and Master of Science, both having been awarded him by the Corcoran Scientific School. He is now examining automatic vehicle brakes and to him is entrusted the entire subclass of Klondike runners. He has been in the division for ten years.

R. A. Morrison, of New Hampshire, entered the Patent Office in 1876. He has served in several different divisions, having spent a long time in Division XXI which treats of ordnance. He is Fourth Assistant Examiner.

There are two stenographers and typewriters attached to the division, Mrs. B. S. Williams and Miss Luella Cooke.

### Compressed Air as a Motor.

Considerable attention is being devoted to the project of operating the cross-town lines of street cars in New York with compressed air. The present method of using horses is not satisfactory, the trolley is inadmissible and the conduit system thought hardly advisable for these short lines. In consequence, the syndicate with which Mr. Whitney is connected is said to have practically decided upon compressed air as the motive power most adapted to the needs of the situation. Cars of this type which are at present in use upon two of the cross-town lines, which derived their supply of air from a recently constructed plant near Twenty-third street, are said to be performing so satisfactorily as to justify an extension of the system.

## IMPORTANT COURT DECISIONS IN PATENT CAUSES.

### U. S. Circuit Court of Appeals For the Dist. of Columbia.

CHRISTENSEN v. NOYES. Decided June 6, 1899.

1. INTERFERENCE—PRIORITY—FORFEITED APPLICATION—CONSTRUCTIVE REDUCTION TO PRACTICE.

As between an applicant resting on a mere constructive reduction to practice, especially when his application is a renewal of a forfeited application, and a party who is really the first inventor and to whom a patent has been issued for the invention, *Held* that priority must be found for the patentee.

2. SAME—SAME.

*Held*, further, that the mere constructive reduction to practice cannot be set up to defeat an existing patent granted to the first inventor. A patent stands for something more than a mere written description of an invention, and against a pending application for the same invention resting upon no better foundation than a constructive reduction to practice, the patent must prevail.

3. SAME—REDUCTION TO PRACTICE—DESCRIPTION AND DRAWINGS.

The description and drawings filed in the Patent Office as part of an application, as against an existing patent issued to the first inventor, cannot be accepted as an actual reduction to practice.

4. SAME—SAME—DEFEATING PRIOR PATENT.

If such written description, illustrated by drawings, will not be allowed to defeat or affect a subsequent patent issued to an independent inventor, a *fortiori* will not such description and illustrative drawing be allowed to defeat or affect a patent granted to the first or prior inventor after the forfeiture of an application first filed, but on a subsequent conception of the invention.

5. SAME—SAME—FORFEITED APPLICATION.

Generally in the case of a forfeited application and the filing of a second or renewed application within two years, the inventor may, under proper circumstances, become entitled to the original or forfeited application as a constructive reduction to practice.

6. SAME—FOREIGN APPLICATION.

An application that has been allowed to lapse or become forfeited and before it is renewed, ceases to have vital or operative effect, except for a very limited and special purpose.

7. SAME—PRIORITY—DILIGENCE IN REDUCING TO PRACTICE.

The proofs show that after Christensen's conception of the device, May, 1894, he disclosed it to others in the latter part of that year; that he tried to obtain money to enable him to apply for patent in December, 1894; that he sought to interest a party in the invention in the spring of 1895; that in June, 1895, an oral agreement was made in regard to the matter; that in December, 1895, working drawings were made and that from that time on to the time he filed his application he was working on the invention; that patterns were finished in 1896. *Held* that it is difficult to conceive that

greater perseverance and diligence could be in reason required, especially of one who for the greater part of the time was in a state of abject poverty and who was under the necessity of pursuing constant employment to procure the means of subsistence for himself and family.

8. SAME—SAME—DILIGENCE IN APPLYING FOR PATENT.

It is a settled principle in practice as well as in reason that forbearance to apply for a patent during the progress of experiments, and until the party has perfected his invention and tested its value by practical experiment, affords no ground for presumption of abandonment, nor should such delay operate in any way to the prejudice of the inventor or to his right to obtain a patent for his invention, certainly not as against a subsequent or junior inventor.

9. SAME—SAME.

Noyes filed his application on May 13, 1895, which was allowed November 26, 1895, and became forfeited on May 26, 1896, by failure to pay the final fee. On April 30, 1896, Christensen filed his application, upon which a patent issued April 20, 1897. Noyes filed a renewal of his application on June 28, 1897, after the patent had issued to Christensen. Christensen proved that he was the first to conceive the invention. Noyes did not reduce to practice in any form prior to the filing of his application. *Held* that priority of invention should be awarded to Christensen. (C. D., 65 MS. Dec., 472 reversed.)

INGERSOLL v. HOLT. Decided December 14, 1899.

1. INTERFERENCE—FAILURE OF PARTY TO TESTIFY.

Where one of the parties to an interference testifies that it was his idea that went into a model and that he directed the other contestant to make the model and witnesses corroborate this and the said contestant fails to testify in his own behalf, *Held* that the contestant's silence is most potent testimony against him.

2. SAME—PRIORITY.

After reviewing the testimony, *Held* that judgment of priority of invention should be awarded to the appellee, Holt. (Commissioner's Decision, 67 MS. Dec., 87, affirmed.)

### Sixth Circuit.

C. & A. POTTS & CO. v. CREAGER *et al.* Decided October 23, 1899.

1. POTTS—CLAY-DISINTEGRATOR—VALID—INFRINGEMENT.

Patent No. 322,393, granted July 14, 1885, to Clayton and Albert Potts for an improvement in clay disintegrators, which consists of a rotating cylinder carrying cutting bars fixed in longitudinal grooves and projecting beyond the surface of the cylinder, acting in combination with a vibratory plate mounted on a shaft opposite the cylinder and moved automatically toward the cylinder in operation so as to continue to press the clay against it as the successive portions are cut away by the cutting bars, *Held* not anticipated by the prior art, valid, and infringed as to claim 6.

2. SAME—SAME—NON-INVENTION—VOID.

Claims 1 and 2 of Letters Patent No. 368,898, granted August 23, 1887, to Clayton and Albert Potts for an improvement in clay-disintegrators, such as shown in Letters Patent No.

322,393, the improvement consisting of the substitution of a smooth roller for the vibratory plate shown in the patented device improved upon, *Held* not to disclose patentable invention and to be void.

## DECISIONS OF THE COMMISSIONER OF PATENTS.

EX PARTE TOURNIER. Decided January 24, 1900.

1. DESIGNS—EXPERIMENTAL USE—PUBLIC USE.

The doctrine of experimental use does not apply to design inventions; but any use of a design in public for whatever purpose is public use.

2. SAME—MEANING OF THE WORD "USEFUL."

The word "useful" in the design patent law has reference to appearance rather than to the mechanical function of the device. The design must not be vicious or have a tendency to corrupt, but its usefulness resides in the pleasing and attractive appearance produced by it. (*Westinghouse v. Triumph Co.*, 97 Fed. Rep., 99.)

3. SAME—SAME—HAS NO REFERENCE TO MECHANICAL FUNCTION.

The utility of a design invention for the performance of a mechanical function is not of the essence of the invention, since two articles may clearly be so different in shape as to properly constitute subject matter for two separate design patents although they perform the same mechanical function in exactly the same way, and two articles may be so nearly alike as to constitute the same design, but at the same time perform entirely different mechanical functions.

4. SAME—EXPERIMENTAL USE—MECHANICAL AND DESIGN INVENTIONS DISTINGUISHED.

The only purpose of experimental use of mechanical inventions is to determine whether or not the device is so constructed as to satisfactorily perform the mechanical functions intended; but since the mechanical function of the device forms no part of a design invention, experimental use of a design is not necessary.

5. SAME—INCOMPLETE DESIGNS.

Since the subjects of design patents are form or contour and surface ornamentation, it is physically impossible for a design to exist in an incomplete condition; but if it has been produced at all it is complete and entitles the producer to a patent at that time.

6. SAME—REDUCTION TO PRACTICE.

The production of a design is what corresponds to the reduction to practice of a mechanical invention, since its utility within the meaning of that term as applied to designs is apparent upon mere inspection.

### Purification of Acetylene Gas.

The generation of acetylene gas by the action of water upon commercial calcium carbide is open to objection on account of the impurities in the gas so obtained, viz., ammonia, sulphuretted hydrogen, and phosphoretted hydrogen. The two former, being soluble in water, are avoided in those generators in which calcium carbide is allowed to fall into excess of water, and even if not completely removed in this way, their removal is a very easy matter by means of the well-known methods used in the purification of coal-gas.



## RECENTLY PATENTED MECHANICAL INVENTIONS AND DESIGNS

Procured through the Patent  
Soliciting Department of E. G. SIGGERS.  
Washington, D. C.

Jacob Faust, Scranton, Pa. Carriage Brake.—The brake is arranged so that the shoes will always follow the wheel whether they are suddenly depressed or elevated, an advantage that will be well understood by persons using the ordinary brakes, which in the above emergencies, leave the wheels and fail to reseat themselves.

The operating mechanism in this case is also new and is a great improvement over that in ordinary use.

Otto F. Baum, Memphis, Tennessee, Trap.—The trap, which is designed for catching roaches, water bugs and the like, comprises two sections, a flat base made of wood or metal and having a bait depression therein, and a screen cover detachably secured to the base and provided at the top with an opening around the inner side of which is arranged a baffle plate. This allows the insects ready access to the interior but prevents their egress. The trap is simple and efficient, is easily cleaned and is always ready for use.

John A. Smith, Kingston, Ark., Harrow.—The machine provides means arranged in advance of the harrow teeth for keeping them clean of trash. Further advantages lie in having the mechanism so arranged that the depth of penetration is easily regulated, and having means for throwing the several parts in and out of operation, the whole making a thoroughly efficient and reliable machine.

John W. Hart, Iola, Kansas. Slicer and Grater for Vegetables.—This device is a very useful household article and comprises a simple construction for grating or slicing various kinds of vegetables, fruits and the like. It may also be used with equal advantage for coring apples, and being inexpensive and durable will have a great sale.

Frank H. Snyder and Nils C. Hansen, Fresno, California. Raisin Seeding machine.—A hollow drum covered by spring wire is arranged over a feed belt, under which is arranged a hard roller. The raisins are fed by the belt to the drum which is rotated by suitable means and the seeds are pressed through to the interior thereof while the pulp is brushed off and removed to a suitable receptacle. A steam jet cleans the seeds from the interior of the drum. This forms a simple machine that is unexcelled in efficiency.

John F. White, Bloomington, Ill. Combination Ironing Table.—This invention provides a combined ironing table and ladder of great simplicity. It comprises two separate members, the ironing board, and the ladder, and either may be used separately, or by combining the two, the board can be clamped firmly to the edge of a table.

Henry Bernhard, Strasburg, Ill. Roller Mill Feeder.—This attachment can be applied to the ordinary roller mill in common use. It consists substantially of a feeding roller arranged in a casing, and a feeder gate that is movable toward and away from the feed roller by mechanism which is capable of being adjusted so as to hold the gate at any desired position. This mechanism forms a feeder that is easily adjustable as desired and that feeds the grain uniformly to the grinding rolls.

William C. Wilka, Rock Rapids, Iowa.—Three patents are the result of this invention and protect the inventor in a complete threshing machine, of great practical value and efficient construction.

The first is the thresher proper. It comprises novel means for adjusting the concaves whereby the machine is easily adapted for any kind of seed. Mechanism is also provided for a thorough agitation of the straw during its passage through the machine and the grain is thoroughly cleaned before its delivery.

Another patent relates to the band cutting and feeding mechanism, and comprises improved means that insures the cutting of the bands and separates the loosened bundles whereby the grain is fed uniformly to the thresher. Another great improvement is an arresting device which prevents more than one bundle at a time passing to the cutter, and thereby overcrowding the same.

The third patent covers the straw stacker which comprises new and efficient means for automatically swinging the elevator back and forth to evenly distribute the straw onto the stack. Novel mechanism is provided for supporting the elevator and adjusting it to the desired height.

Henry J. Park, Navasota, Texas. Rail Joint.—This improvement does away with the necessity of threaded bolts and nuts and provides, instead, a series of headed bolts having notches on opposite sides of the shanks, which are engaged by a wedge shaped locking plate that is provided with suitable keyhole openings for that purpose. The adjacent fish plate is corrugated in order to secure the locking plate in position.

Chas. A. Curl and James D. McAnlis, Beaver Falls, Pa. Table.—The present invention relates to extension tables wherein the table-top is divided into a central large section and smaller end sections, the latter of which are carried by the adjustable slides. It comprises means for storing the extra leaves or fillers below the table top where they are completely out of sight and out of the way, but can be readily reached when wanted for use. This is a very desirable improvement and will be greatly appreciated.

John J. Fahrney, Timberville, Va. Wrench.—This wrench may be used either as a nut or pipe wrench as desired. The handle is pivoted and has a direct connection with the inner sliding jaw by means of a screw threaded rod. By this means, after the proper adjustment has been obtained, the inner jaw will be reciprocated when the handle is vibrated, thus giving a fresh grip upon the pipe, nut or other object without attention on the part of the operator.

William B. Mahan, Palmyra, Ill. Weather Strip.—This invention is designed to be applied to the lower edge of a door so that when it is closed, it positively prevents snow, rain or air to pass under the same. It is simple and durable and is out of the way. The parts are adjustable for different sized doors, and altogether is a very useful invention.

Robert E. Hardaway, Carrollton, Ga. Windmill.—This invention, which is an improvement on a previous patent to the same inventor, consists in a vertical series of wheels which are surrounded by a suitable casing. This casing is divided into compartments having doors which are independently arranged so that any or all wheels may be exposed to the wind to obtain any power desired. The invention is very practical, and the construction allows it to be used as a water motor if so desired.

James H. McGurty, Jersey City, N. J. Controller Attachment.—The invention is designed as an attachment which can be applied to any controller for electrical or other apparatus. It comprises novel and simple mechanism that limits the speed with which the electrical current is thrown upon a motor or other electrical machinery. It thus absolutely prevents the overloading of the machines and the subsequent injury to passengers. This will be highly appreciated on the electric motor cars, as it will also prevent the sudden jerking of the car and passengers by careless or indifferent motormen.

Roscoe A. Merrow, Farmington Me. Bicycle.—The frame of the bicycle is made adjustable whereby it may be arranged to suit the rider or it may be taken apart and thus occupy very small space for storage or transportation. A novel arrangement of driving mechanism is provided, using neither chain nor rotating side shaft. The whole construction is simple and practical and will find great favor.

Wilson W. Miller, Saxman, Kansas. Grain Drill.—This invention embodies a construction that is a great improvement in this art. It provides means for utilizing all the ground, especially where the grain is sown between rows of corn. The width of the machine may be varied to suit the convenience and the minor details are all greatly improved so that the whole machine presents many advantages over the ordinary construction.

Ellsworth Pearl, Rochester, N. H. Swage and Punch. A head carried on the end of a handle, is provided with a longitudinal bore within which is mounted a spring pressed punch. A groove is provided on the under face of the head for the reception of the article to be operated on. This provides a simple device by means of which horseshoes or like articles may be punched or swaged without bulging the metal.

Luther G. Rogers, Avery C. Bruce, James C. Roberts, and Frank A. Russell, Knoxville, Tenn. Cradle Motor.—This invention comprises a compact spring motor of simple construction that is arranged upon the base of a cradle and has connecting means with the cradle proper whereby it will impart a smooth and even motion without jar or pounding to the same. The device is practical and is a great time and labor saver.

William N. Rook, Clinton, Ky. Window Shade Adjuster.—A pair of vertical guides are arranged on each side of the window frame, and a cross piece which carries the shade roller is slidably mounted in these guides. This cross piece has a vertical arm which serves as an operating handle and which is engaged by a spring to hold it in the desired position. By this efficient means the entire shade may be raised or lowered to admit light and afford ventilation above the roller.

Guert E. Wilder, Sandusky, Ohio. Furnace.—The invention consists substantially of a furnace having the side walls of its combustion chamber expanded laterally and outwardly above the plane of the grate, a bridge wall with its face adjacent to the grate, arranged to slope in opposite directions from a central ridge, and air blast pipes embedded in the side wall of the combustion chamber below the inclined portions thereof, and having a plurality of injecting nozzles,

which discharge air into the combustion chamber by the grate. This construction not only acts as a great fuel saver, but also a greater heat is obtained than is possible in the ordinary furnace.

Charles Schmidt, Ayrshire, Indiana. Drilling Machine.—The present invention relates particularly to machines for drilling coal, and comprises means whereby it may be readily adjusted for drilling holes in different directions after it has been anchored in place. It is also constructed to receive an extension bit without removing the first one, after the latter has been driven into a bed of coal. Other advantages help to make the machine a great improvement over the ordinary drilling machine in common use.

Charles A. Paul and William Wibben, Orlando, O. T. Threshing Machine.—The invention consists in the combination of a slatted or grated concave, a bed cylinder having projecting cross bars, crushing and feed rolls arranged in advance of the cylinder and a ledger plate fixed adjacent to the threshing and feed rolls. This does away with toothed cylinders, with a consequent saving of power, and especially adapting the machine for treating Kaffir corn.

Jesse W. Phoebus, Wheeling, W. Va. Stereotyping Process.—The process which is simple consists in manufacturing the matrix without the use of heat and moisture, thereby obviating the objectionable process of heating the type and at the same time avoiding the usual delay in waiting for the matrix or mold to dry before being ready for use, advantages that will be readily understood and highly appreciated by those skilled in the art.

Thomas Thompson, Dayton, Ohio. Non-Refillable Bottle.—A sliding cork of peculiar construction is arranged in the neck of a bottle in such a manner that it allows the contents of the bottle to be poured out, but absolutely prevents the bottle being refilled. The device is simple but effective, and as it prevents fraudulent substitutes being put in bottles once used, should find favor among manufacturers.

Carl R. Blasse, Pittsburg, Pa. Canceling Stamp.—This stamp is particularly intended for use in post offices though it may be used in a variety of ways. It has a continuous inking ribbon, which is arranged over the type and can be adjusted successively by a movement of the hand by which the stamp is held, such adjustment being accomplished without the necessity of stopping the operation. This does away with the necessity of an inking pad, while allowing a consequent increase of speed on the part of the operator. New and simple means are also provided for securing the removable type in place so that the same may be easily and quickly interchanged.

Henry T. Cahill, West Union, W. Va. Liquid Saver.—The device comprises a cylindrical plug made of cork or rubber and adapted to fit over the neck of a bottle. This plug is provided with two openings, one to receive the end of a funnel, the other to allow the escape of air. By this very simple and inexpensive means, a device is provided that absolutely prevents the inflowing liquid from being forced out of the bottle by the escaping air, and at the same time permits the bottle being filled rapidly.



# *Inventive Age*

## AND PATENT INDEX.

Established 1889.

### INVENTIVE AGE PUBLISHING CO.,

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The INVENTIVE AGE is sent, postage prepaid, to any address in the United States, Canada, Mexico, Hawaii, and Porto Rico, for ONE DOLLAR a year; to any other country, postage prepaid, ONE DOLLAR AND A HALF.

Correspondence with inventors, mechanics, patentees, and manufacturers, is invited. The columns of this journal are open for the discussion of such subjects as are of general interest to its readers.

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WASHINGTON, JUNE, 1900.

### Our Plea.

Patentees should keep themselves informed as to the progress of invention in the line of industry in which they are interested. Frequently improvements on their patents are patented by others, which are clear infringements of their rights, for the grant of a patent does not, as is commonly supposed by some, settle the question of infringement. An earlier patent may infringe a later one, or *vice versa*. By keeping posted on the issue of patents each week, an infringement may be stopped before it has done much, if any, harm.

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### A NEW MACHINE.

A Russian by the name of Euzebuiz Polanowski has recently patented a machine which has for its object to mill out the periphery of conical disks in such a manner as to produce cone-wheels or bevel-wheels with angular teeth that is to say, bevel-wheels having sagittal teeth. The machine can also be employed for finishing (by milling) cast angular-toothed bevel-wheels. In this machine the cone-disk or bevel-wheel to be treated, and which rotates during the milling, is cut out by a rectilinearly-moving milling-tool, the rotary axis of which is situated in the same plane as the axis of the bevel-disk and in which plane both axes form an acute angle with each other.

The machine is also provided with a self-acting returning motion or reversing-gear in such a manner that the bevel-disk to be milled makes during the milling of each tooth, first, a forward rotation up to the middle of the tooth to be cut, and then while the milling-tool continues to move in the same direction, the bevel-disk moves back again until the milling-cutter has left the bevel-disk. During the return of the milling-tool the bevel-disk is moved in the reverse way.

### SPECIAL OFFER TO PHOTOGRAPHERS.

THE INVENTIVE AGE makes a feature of illustrating new inventions and new triumphs in engineering and mechanics.

Under this heading may be classed the building of canals and waterways, modern vessels and war ships, modern buildings, interior views of model machine shops and factories, railroad bridges, views of engineering achievements of every nature, natural wonders and discoveries, engines, motors and developments in electrical science.

We desire the assistance and co-operation of amateur and professional photographers everywhere. Every photographer has in his collection, or can obtain, one or more views that can be used in the AGE.

Not only will we give the artist credit for any view used, but in addition we will forward the AGE free one year to his address. In instances of special merit and "views of extraordinary achievements of genius and labor, cash prizes will be awarded.

Readers of THE INVENTIVE AGE in all parts of the world will confer a favor by advising local photographers of our request.

It is also desired that accompanying each view, there should be sent a complete description of the subject or enterprise, or that the address of some person be given from whom complete information can be obtained.

### MICROBES.

The recent discovery of liquid air has afforded an opportunity for studying the effect of cold upon microbes. Liquid air will freeze mercury so hard that one can drive nails with it. Yet microbes are as lively as ever after having lain a week in this astonishing fluid. At the recent Royal Society meeting in England a student of liquid air stated that he had subjected the germs of typhoid, diphtheria, cholera and other diseases to the temperature of the new fluid for a period of seven days, during which time they also sustained a tremendous mechanical strain, but not the slightest effect was produced, either on their vitality or their form. It is popularly believed that germs are destroyed even by the ordinary low temperatures of nature, but the fact that a cholera germ can live seven days in liquid air may do something to dispel such notions and lead to a wiser direction of sanitary measures.

### A NEW FEATURE OF THE AGE.

THE INVENTIVE AGE is distinctively the inventors friend and guide, and its columns are open to them for the purpose of presenting to the world the merits of their various inventions, embellished with cuts made from the Patent Office drawings or otherwise. THE INVENTIVE AGE will publish a description of any meritorious patent, together with a single column cut, and furnish 25 copies of the number containing the article for \$5, if the article does not exceed one third of a column, (about 175 words); one half column, (about 275 words) \$8; one column, (about 600 words) \$10. This includes cut, which becomes the property of the advertiser. When cut is furnished by the patentee, we will allow fifty copies of the "AGE." If additional copies of the magazine are desired, they will be furnished at the rate of \$5 a hundred. For a larger number, or longer article, write for special terms. To insure publication, all articles and copy for advertisements should be in by the first of the month.

### HOME WORK vs. FACTORIES.

There are signs that the European workman may return to the old system of "home" work, which has declined over there and has been practically abandoned on this side of the water owing to the greater economy of the factory with its steam power. The use of electricity, it is thought, may cause a reversal of methods and, through its facility for power distribution, may pull down what steam built up. Experiments are now being made in Europe looking to supplying electricity for small motors at the homes of workmen instead of gathering the workmen into large establishments. The idea is to bring the power to the man instead of taking the man to the power. It is to be ascertained whether manufacturing can be conducted as cheaply or profitably in the homes of the people as in the huge buildings of the capitalist. The Electrical Review states that a Budapest company will fit up a workshop near its generating plant, and those engaged in any trade which requires only a small amount of power will be able to obtain electrical power at a very small cost.

In certain districts of France, where ribbons are made, the idea of taking the power to the workers has been more nearly realized. In the watch-making districts of Switzerland and in the lock, gun, lace and other industries of France and Germany the conditions or customs of the people favor the distribution of power. "The idea," says the Review, "of gathering together in a factory building the personnel of one of these industries is repugnant to the workmen, who prefer the greater freedom of home work, where they make their own hours and are under no direct supervision. It is to this class that it is proposed to distribute electric power in small units and at small cost, and the experiment is awaited with much interest by those engaged in manufacturing.

The chief objection to such a change so far as small machinery, for instance, is concerned, is that manufactures conducted under the system necessarily fail in the all-important requisites of standardization of sizes and ability to interchange parts.

The presumption from the American business point of view is against the scheme of carrying power to the homes of the workers. There will be waste of electricity in distributing it, to say nothing of the cost of wires and motors on which interest must be earned. In Europe, where conditions are different, and their factory system less general, it may succeed.

An American who knows, recently told a Briton the reason why the American machine succeeds abroad. Said he: "We originate and we manufacture on a large scale, thus securing economy. You have been sitting in that chair ten minutes and during that time we have finished and put into warehouse twenty reaping machines or field mowers, weighing from 700 to 1,500 pounds each. You English are our strongest competitors in foreign markets; but the Swedes and Germans are creeping up every day. They copy everything, but copying will never get more than the dregs of a trade. The country that originates will always be ahead. Moreover, it is no good copying patterns unless you copy methods too. If a German buys one of our machines and tries to make it he is met by difficulties at every turn. He wants our special tools, our organization, our materials; and then he must produce on the same scale we do to get the same economy."

### NEW BOOKS.

The growing importance of the automobile under its various names and in its varied types gives special interest to "Horseless Vehicles," by Gardner D. Hiscox, M. E. just issued by Norman W. Henney and Co, N. Y. The book treats the subject in a very broad way and is thoroughly up to date. It includes illustrations and descriptions of horseless vehicles of all kinds, clearly setting forth their principles in a way that cannot fail to be appreciated by those who desire accurate information in regard to the beginning and growth of this new era in locomotion. It first takes up the historical aspect of the business, then the appliances both special and general for steam automobiles, following this by a chapter on the steam automobile considered as a whole, ranging from the heavy steam roller for making the streets, to the light graceful carriage that runs over them after they are completed. A chapter each is devoted to explosive motors and to electrically propelled vehicles. The book concludes with a discussion of the bicycle automobile. It has an appendix giving a list of the automobile and motor manufacturers of the country, with their addresses. Its price is \$3. post paid.

Another valuable work issued by the same firm is "Gas Engine Construction", by H. V. A. Parsell, Jr, and A. J. Weed. This work treats of its subject more from the standpoint of practice than of theory. The principles of gas engines are fully and simply described, and then the actual construction of a small engine is taken up and discussed step-by-step until the completed gas engine stands before the reader. The entire engine described, with the exception of the fly wheels, can be made on a simple eight inch lathe, with slide. First come directions for making the patterns, followed by all the details of the mechanical operations of finishing up and fitting the castings. Dimension working drawings add greatly to the value of the text. The erection of the engine is described so clearly that no mistake is possible. The book closes with a chapter on American practice in Gas engine design, and with a set of simple rules for calculating the dimensions required to produce an engine of a given horse power.—Price \$2.50, postpaid.

The souvenir portrait edition of "The Railway and Engineering Review" of Chicago is one of the handsomest specimens of a trade journal that has been issued for a long time. It was prepared in honor of the Master Car Builders and the American Railway Master Mechanics Association, which were in session at Saratoga, New York, from June 18 to 23, and contains over four hundred excellently engraved medallion portraits of officers and members of the associations. Besides this, it is a particularly valuable edition, containing many articles of special interest to railway men. The editors have a right to be very proud of the issue as it is without doubt one of the finest special editions ever published by any railway paper. The hundreds of pictures published make it a veritable photograph album, and insure its being kept and frequently referred to in the years to come.

According to a contemporary the greatest trouble with the pneumatic tire on heavy vehicles is not caused by puncturing, which accounts for only 7 per cent. of the trouble, but results from the internal wear of the fibers, due to the weight. Some tires which have been examined show the fibers of the material reduced to a fine powder.



# SEWAGE IRRIGATION

## PART IV.

### Chemical Precipitation. Intermittent Filtration.

Sewage disposal or purification has resolved itself into three general methods, which are known as (1) chemical precipitation, (2) intermittent filtration, and (3) broad irrigation. While we are not specially concerned with chemical treatment, nor intermittent filtration, except so far as they may be considered an adjunct of irrigation, for completion of the subject, however, we may briefly describe these different treatments.

In chemical precipitation the sewage is allowed to flow into large tanks, in which it is dosed with certain chemicals; these form with the organic constituents an insoluble precipitate, which in its descent to the bottom of the tank may, under favorable circumstances, carry down with it the suspended matter of the sewage as well as a portion of the dissolved. To apply this treatment on a large scale, extensive works with a large number of tanks, together with machines for grinding and mixing chemicals as well as special mechanical arrangements for mixing the chemicals and sewage and caring for the sludge are required, and the whole includes what is commonly called the chemical treatment of sewage, although the complete process is in reality partly chemical and partly mechanical.

In order to insure the best results in chemical treatment the sewage should be treated while fresh and the chemicals added to the flowing sewage, in order that they may become fairly incorporated before it passes into the settling tanks. There should also be enough tank space to insure a thorough precipitation. Inasmuch as the sludge must be frequently removed from the bottoms of the tanks, the mechanical arrangements should be such as to permit of its removal without interruption of the works.

Methods of chemical treatment may be classified as (1) intermittent treatment in shallow tanks from 5 to 8 feet deep, in which after the addition and incorporation of the chemicals, the sewage is allowed to remain undisturbed until the completion of the process, when the clarified liquid is drawn off the top, leaving the sludge at the bottom; (2) continuous treatment in a similar series of tanks through which, after the addition and incorporation of the reagents, the sewage is allowed to flow slowly, crude sewage with freshly added chemicals passing in at one end and purified effluent passing out at the other; and (3) vertical tanks through which, after the addition of chemicals, the sewage rises slowly. At the present time the continuous treatment, in which crude sewage with freshly added chemicals passes into one end and purified effluent passes out at the other continuously, is considered, as the result of experience, to be the preferable method of applying the chemical treatment.

The mixing of the chemicals with the sewage is effected either by the use of baffle boards in the conduit leading to the tanks, or, where this is impracticable, by the use of mixing wheels. As the problem is merely one of thorough mixing, it is unnecessary to discuss it at length. Usually very simple mechanical appliances are sufficient.

As to the tank capacity required, it may be stated that in systems which are arranged with reference to receiving a portion of the rainfall, the daily capacity should be nearly 50 per cent of the average daily flow, an allowance of this kind giving some leeway for contingencies when required. With the sewage from separate systems of sewers less leeway will be required.

The liquid sludge, as it ordinarily comes from the settling tanks, con-

tains from 90 to 95 per cent water and from 5 to 10 per cent solid matter, and various methods of disposing of it have been used. One is to pump it into basins, from which it is subsequently conveyed to adjacent areas for utilization as fertilizer. It is also frequently deposited in large open basins surrounded by embankments, from which, after the larger portion of the water has been drained away, it is removed either for use as a fertilizer or to some other point for filling in low land, etc. The liquid sludge is also sometimes run directly onto agricultural areas, where it is easily disposed of by plowing in. It may also be



FILTER AREAS WITH ABSORPTION DITCHES, LUTON, ENG.

mixed with combustibles and disposed of by burning. In some cases it has been used to form compost heaps by mixing with earth, rubbish, vegetable mold, gypsum, stable manure, leaves, or other suitable materials. When disposal works are situated near tide water, the sludge may be disposed of by running it into pumping scows, which convey it to deep water for dumping. It may also be burned in a furnace similar to the garbage destructor, but for this purpose it requires partial desiccation before treatment. On the whole, however, the most practical way of treatment is to compress it into solid cakes by the use of a filter press. In this form it is entirely innocuous, and may be stored, handled, or conveniently transported for use, either as a fertilizer or for filling in low lands or for other purposes.

By way of disposing in this place of the question of relative degrees of purification attained by the different processes, it may be remarked that there is now a vast body of information, all showing that land-treatment methods, when properly operated, easily remove all the suspended organic matter of sewage as well as from 95 to 99 per cent of the dissolved matter. As a problem of efficient purification therefore, the superior efficacy of the land treatments may be conceded without further discussion.

Intermittent filtration means the concentration of sewage at short intervals on an area of specially chosen porous ground as small as will absorb and cleanse it, not excluding vegetation, but making the produce of secondary importance. The intermittency of application is absolutely necessary, wherever complete success is aimed at, even in suitably constituted soils. In this method, a tract of land is always selected, the soil of which is open and porous. If this is not available, surfaces are prepared, the natural soil being removed and replaced by a filling of sand or similar filtering material, beneath which is arranged a series of porous tile pipes or conduits which carry off the effluent. The sewage is run upon these beds and allowed to filter through the same. As originally used, a series of level filter beds were provided so that while one was settling, another was being

covered. It was therefore impossible to cultivate to any extent the soil, and no return of profit could be derived from its employment. It has been found, however, that by ridging the beds, they are made more effective, and that they can be used as well in winter as in summer, a drawback that had before seriously interfered with their use in the colder climates, and furthermore that the tops of these ridges could be advantageously cultivated with a consequent profit.

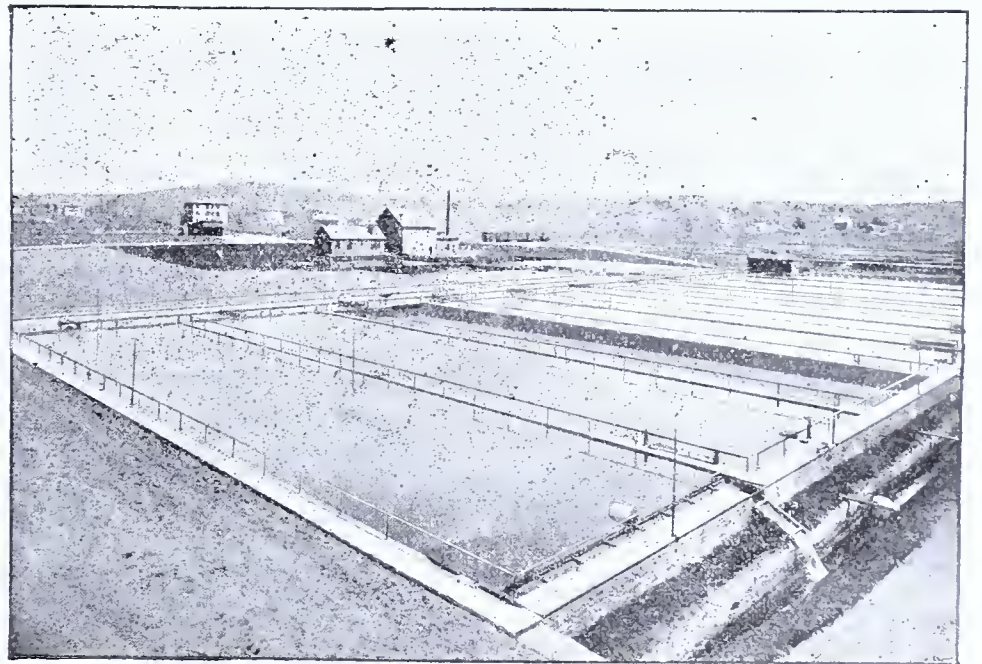
It should be remembered that these filters do not act simply as strainers which allow the liquid to percolate through and retain the solid and or-

mal refuse is received and purified on the surface of the earth, and this is what is aimed at in the sewage farm.

The simple filtering power of the soil will depend upon its mechanical condition, while the precipitating power is a chemical function, in which the hydrated ferric oxide and alumina and the silicates of soils play the principal part. The oxidizing power will depend partly on its mechanical, partly on its chemical, and partly on its biological condition. We now know that a porous medium is not absolutely essential for purification and that sewage may be nitrified in a glass bottle or when passing over polished pebbles. Although porosity is by no means essential to the nitrifying power of soil, it is a condition having a very favorable influence on the rapidity of the process, porous soil of open texture presenting an immense surface, which will become covered with a thin film of the nitrifying organisms, and which, by reason of its porosity, will be well supplied with the air requisite for the discharge of other functions. This fact explains why nitrification takes place more rapidly in soil than in liquid.

In the Twentieth Annual Report of the Massachusetts State Board of Health we find stated as a fundamental proposition of intermittent filtration that sewage can be more efficiently filtered through open sand than through sand covered with soil, and that the upper layers of intermittent filtration areas should be of coarse sand, into which the sewage will disappear rapidly, leaving room for air to enter and come in contact with the thin laminae of liquid covering the particles of sand. As regards the purification of sewage through the medium of nitrification, the chief points established are that the best results are obtained in filters which have been in work for some time, thus becoming adapted to the special service they are to perform; that free oxygen is indispensable for success; and that sewage is best purified when held in thin films upon or between sand grains and gravel stones. A very elaborate and highly successful series of experiments has been made in this line by the Massachusetts State Board of Health at the Lawrence experiment station. One of these experiments is especially interesting.

A natural area of fine river silt of about one-third of an acre was prepared by partial underdraining with drains 60 feet apart, which were designed chiefly to catch samples of the



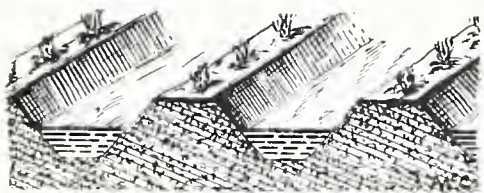
CHEMICAL PRECIPITATION WORKS AT WORCESTER, MASS.

angers, whose existence was not even suspected until late in the seventeenth century. They are known to us as bacteria or more familiarly as microbes, and are found everywhere, but those with which we are concerned, live and move and have their being in the upper layers of the soil. By far the largest part of ani-

effluent. This area is on the banks of the Merrimac River near the experiment station at Lawrence, Massachusetts, with its surface several feet above the ordinary stage of the river. The surface of the location selected slopes at the rate of about 1 foot in 10 in one direction and about 1 in 100 in the other. A series of shallow trench-



es which follow the surface of the field are excavated in the original material. They are mostly made 1 foot wide top and bottom, with varying depths from 6 inches to 3 feet, and filled in with a coarse mortar sand. These trenches are five feet apart and are each about 200 feet in length. The distance which sewage will flow in them varies with the amount applied and the amount of sediment upon the surface, which again varies with the quality of the sewage, the completeness of the nitrification, and the time elapsed since the surface was cleaned. As to the cleaning of the surface, it is found desirable that it be done occasionally, usually at periods of from one to three months. The removal of a quarter of an inch in depth from the surface of the coarse sand appears to be sufficient. During the winter the trenches have been covered with boards, with the result that the process of purification proceeded readily during the entire winter.



SECTIONAL VIEW OF DITCHES.

The result of this experiment indicates that in very fine sand of the quality here found from 50,000 to 60,000 gallons of sewage per day may be efficiently purified with a renewal of the sand in the trenches of perhaps 2 to 3 inches annually. Filters composed of either coarse mortar, sand or fine gravel, or coarse sand and gravel mixed may be expected, however, to filter from 80,000 to 100,000 gallons per day per acre.

The leading fact of intermittent filtration as stated is that the organic matters of sewage are destroyed instead of being stored in the filter, as is largely the case with other methods of purification. The experiments, however, have shown that the conditions allowing thorough purification of the maximum volume with the best results are such that a small percentage of the more stable organic matters of the sewage resists the reducing action of the filter and tends to accumulate in its upper layers, until after a time the surface becomes choked to such an extent that the sewage will not sink freely below it, thus violating the fundamental principle of intermittent filtration. As a remedy it is suggested that temporary relief may be obtained by simply turning the surface under, although evidently an indefinite use of the same material would be impracticable if anything like a maximum quantity of sewage were treated. Since the organic material thus accumulating is confined entirely to the upper few inches of the filter, it is considered best to occasionally renew the upper layers of sand.

(To be Continued.)

#### DANGEROUS DOOR KNOBS.

Now scientists are declaring that door knobs are infested by microbes. These organisms, thrive on these in-nutritious substances, it appears, and in a round of calls one may collect a variety of germs from the doors of cabs, houses and elevated trains. The danger may be obviated by anti-septic gloves, it is said, but, considering the unconcern with which women now gather up the bacteria of the streets with their sweeping draperies, one does not expect them to be inordinately nervous about the few organisms that may attach themselves to their fingers.

#### THE OVAL WOOD DISH PATENTS.

##### Extension Prayed For. Interesting Experience of an Inventor in Exploiting His Patent.

Under the present law, the obtaining of an extension of a patent is hedged about by so many requirements, involving such expense and trouble that there has been no patent extended for many years. The first step to be taken is to procure the passage of an Act of Congress, after which the matter is referred to the Commissioner of Patents for his action.

Certain complex rules of procedure governing applications for the extension of a patent have been prescribed by the Patent Office, which it is not necessary to dwell on now, as the case we refer to has not yet passed through Congress. It has, however, received a favorable report from the Committee on Patents of the House of Representatives, which report is so interesting and instructive that we here give it in full.

In the latter part of the year 1882, Seth H. Smith conceived the idea of manufacturing thin, seamless, oval wood dishes, for the use of grocers and others, by means of a machine with peculiarly formed knives working together to cut the dish from the face of a block of wood with great rapidity and economy. He expended much time, labor, and money in constructing a machine suitable for the purpose, and when the work was in a more or less perfect state, he applied for letters patent to cover the dish and the machine for making the same.

On the 13th, day of March, 1883, he obtained Letters Patent No. 273,773, covering the said wooden dish, and on the 24th, day of April, 1883, he obtained Letters Patent No. 276,198, covering the machine for cutting said dishes.

It was his purpose to manufacture such dishes so cheaply that they could be sold to grocers, butchers, and merchants generally, and by them be given away with the contents, as wrapping paper is given away. By the time that said Smith had obtained his letters patent, as aforesaid, he was practically without means to commence the business of manufacturing dishes, and the first machines made were naturally of a crude and imperfect character. The entire novelty of the invention made an unusual amount of experimental work necessary, as he had to create novel machinery instead of improving old machinery. But through the assistance of friends, financially, he succeeded, after a time, in perfecting his machines, and afterwards in interesting them to commence the manufacture of dishes, and a small amount of money was invested in the enterprise, those engaging in the manufacture of said dishes agreeing to pay said Smith, as the owner of the patents, a royalty for the dishes manufactured and covered by his invention.

The business had hardly started before a disastrous fire, on March 1, 1887, consumed the building and machinery where the manufacturing was carried on. The buildings were immediately rebuilt and new machinery provided, when another fire occurred, December 26, 1887, more serious than

the first, entailing great loss upon those engaged in the business, as well as the loss of royalties to said patentee. More than half of the year 1888 was lost before they could resume the manufacture of dishes. Therefore, between the necessary experimenting to perfect the machinery and the successive fires which occurred after he induced his friends to assist him with the necessary capital, more than five years of the life of the patents had expired, for which time he received practically no financial benefit and his licensees had incurred only losses. The business was only fairly started in the latter part of 1888, and the value of the invention was at once appreciated by the public, as evidenced by the fact that infringements were promptly begun by persons and corporations in different parts of the country, and the inventor, Smith, to determine his rights, was forced to bring a series of suits in the United States courts against these infringements. The first suit was begun June 12, 1889, in the United States circuit court of the district of Indiana, against William D. Johnson and others. A great deal of time and the expenditure of a large amount of money was made necessary by this suit. Other suits followed, to wit:

December 10, 1891, in the United States circuit court for the northern district of New York, against the Sandy Creek New York Wood Manufacturing Company, Limited.

March 22, 1893, in the United States circuit court for the eastern district of Michigan, against Paige & Strachan.

August 30, 1893, in the United States circuit court for the northern district of Illinois, against William D. Hollis and John A. Duncan.

1893, in the United States circuit court for the southern district of New York, against D. S. Walton & Co.

March 23, 1894 in the United States circuit court for the eastern district of Michigan, against James W. Fales.

1894, in the United States circuit court for the southern district of New York, against the American Wooden Ware Company.

1894, in the United States circuit court for the district of Louisiana, against the Morris McGraw Wooden Ware Company (Limited.)

Every means of delay was resorted to by the defendants in these suits; and the total cost of this litigation up to the final decision in March, 1894, was over \$35,000. It was not until March 5, 1894, that the patentee succeeded in getting a final adjudication on his patents in the case of Seth H. Smith et al v. the Sandy Creek New York Wooden Ware Company, Limited. In this decision Judge Alfred C. Cox, in commenting on the invention, used the following language (p. 291, vol. 60, Federal Reporter).

"Complainants' machine is most complete and ingenious. Mechanical skill could never have produced it. It required a high order of inventive talent. The problem to be solved was one of unusual difficulty, the dishes must be strong, light, thin, and of uniform size. They must be cheap, and they must not sliver or split or lose their shape. They must be capable of being packed in a small space so that they can be transported conveniently

and without injury. It is idle to assert that one who has constructed a machine which has overcome all these obstacles, a machine which has created a new art and supplied commerce with over 100,000,000 such dishes annually, is not entitled to a place among inventors. Moreover, as before stated, he is entitled to liberal treatment at the hands of a court of equity. \* \* \* No machine ever before did what the Smith machine does, and the complainants are entitled to hold as an infringement a machine which does the same thing and accomplishes the same result, even though the parts are ingeniously changed for the purpose of avoiding infringement."

This decision was only reached in 1894, and we therefore find that eleven years of the life of the patents had expired before the patentee succeeded in establishing his rights under said patents. The expenses necessarily incurred during this period far exceeded any returns, as the only recovery in all these suits was \$3,000, the defendants in the principal suits being practically irresponsible; and during all these years of litigation the infringers manufactured the dishes and placed them on the market in large quantities, robbing the inventor of the profits rightfully accruing to him. A disastrous fire in 1896 still further deprived the inventor of his natural profits.

In short, it may be said that the expenses incurred by Smith in experimental work perfecting his machine, the costly and prolonged litigation, the ruinous competition which he encountered while said litigation was going on, and the loss of time by disastrous fires, have resulted in depriving the inventor of any substantial profits for his invention, which is an extremely useful one, and virtually limited its life to a period of six years instead of seventeen years, which the law provides.

The bill before Congress asked for a ten year extension, but the committee cut that period in half.

Inasmuch as the dish produced by this invention comes in competition with other wood and paper dishes manufactured and used for the same purpose, and the extension of these patents would not create a monopoly and would work no injustice or hardship to anyone, the application for extension is a most meritorious one and should be enacted into law.

#### A NEW BOOK FOR INVENTORS.

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##### Money out of Them.

By W. B. HUTCHINSON.

This is the only book published, giving a detailed and full account, from the author's actual experience, of just what steps are necessary from the time the invention is conceived, to the time it is sold, with a clear and concise resume of the law and practice, legally and commercially, of trademarks and copyrights. It also tells accurately how and what to invent, how to sell inventions, place them on the market, interest capital in them, and to successfully promote a stock company. It also contains an index of forms worth double the price of the book, to any one interested.

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## RECENT PATENTS.

## Railroad Signal.

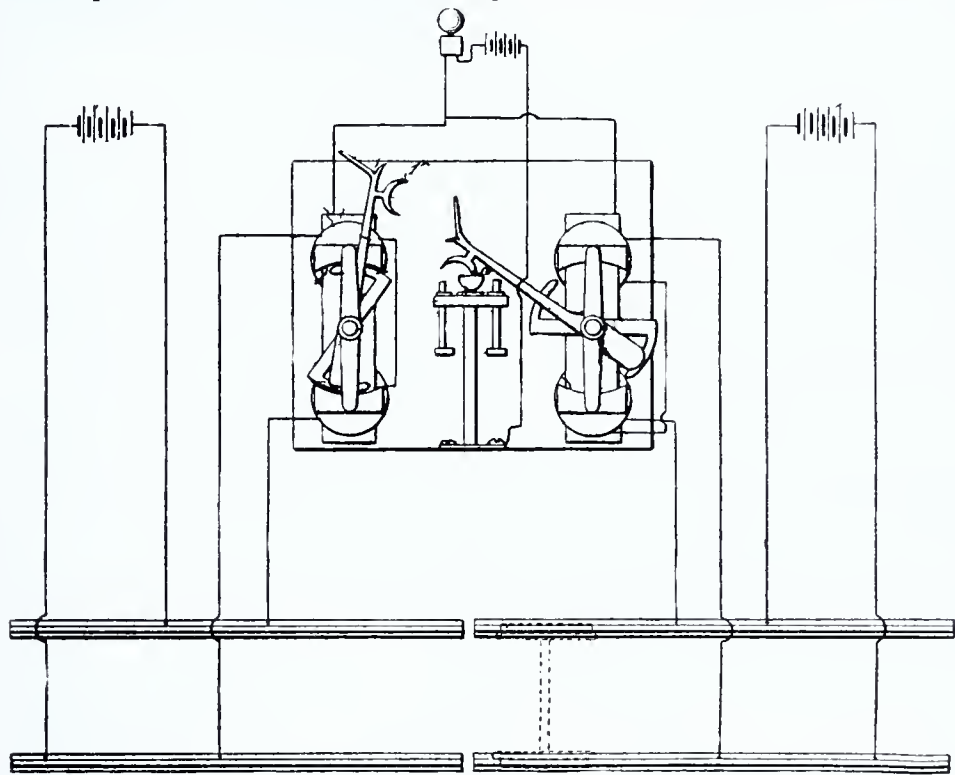
An especially valuable invention is a recently patented electrically operated signal for railways, the inventor being Judson Shoecraft, of 314 Monroe St., Topeka, Kas., who has assigned his right to Charles G. Gardiner, of Bradford, Kans.

The invention is especially designed for use in connection with a railway crossing and provides positive and reliable means for automatically giving a signal or sounding an alarm upon the approach of a train from either direction.

Mr. Shoecraft has obtained a number of patents in this line, but it is hardly thought the present invention can be improved upon. As shown in

lating device is easily accessible for adjustment and control, and the several parts are readily separable for removing the spent carbide without soiling the hands.

The invention also provides a means serving as the water admission and regulating device, and as the outlet pipe for the acetylene gas, and said means also has a handle for its convenient manipulation to regulate or cut off the flow of the water to the carbide without, however, obstructing the passage of gas to the burner. As



the diagrammatic view presented herewith, the invention contemplates an improved type of relay which has a novel form of armature cooperating with a peculiarly constructed arm, which not only acts in the capacity of a contact for closing the bell or alarm circuit upon the approach of a train, but also, in connection with its companion, serves to lock the apparatus out of operation as soon as the train has passed a crossing, and prevents the apparatus from being restored to its normal condition until the out-going train shall have passed the track section on the outgoing side of the crossing or other alarm point.

The relays are provided with rotary armatures carrying arms whose contiguous ends are provided with combined contact and inter-locking members. A common contact for both arms is provided with which they are adapted for mutual engagement to raise the arms with their contact members out of operative position and lockingly hold them. A bell or alarm circuit is included in the contact and both armatures, and separate local circuits are provided for the relays.

## Acetylene Gas Lamp.

A novel acetylene gas lamp has been patented by Peter F. McCaffrey, and Thomas A. Dunshee, of Salt Lake City, Utah.

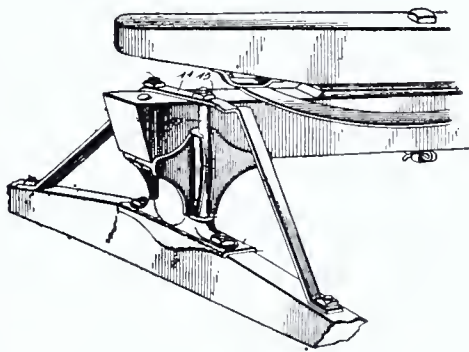
The construction provides a simple structure in which the carbide receptacle, the water reservoir, and the water regulating devices are all housed within the lamp casing in operative relation one to the other. The regu-

lating device is easily accessible for adjustment and control, and the several parts are readily separable for removing the spent carbide without soiling the hands.

## Sleigh Knee

Another interesting invention is a sleigh-knee recently patented by Kinsey Jones, of Janesville, Wis.

One of the objects of this invention is to improve the construction of that class of sleigh-knees which are provided with grooves or ribs to receive rigid upright runner bolts or rods, and which permit a limited oscillation of



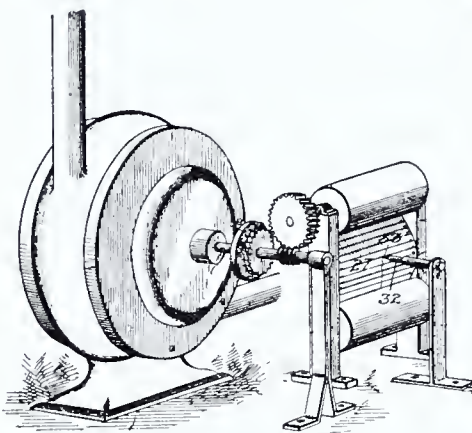
the runner, and a further object of the invention is to enable such rods to be rigidly secured at their lower ends to the runner without perforating and weakening the latter.

In carrying out this invention a runner plate is secured to the runner and provided with sockets or thimbles terminating at the upper face of the runner, and having their lower ends enlarged. The rigid upright rods have their lower ends arranged within these thimbles or sockets of the runner plate and are provided with heads

fitting in the enlarged portions thereof and abutting against the upper face of the runner. By this means they are rigidly connected with the latter without perforating the same, and the rods are secured at their upper ends to the rave of the sleigh. A knee is mounted on the runner plate and loosely arranged between the rods, being provided with grooves for the reception of the same.

## Air Meter.

Samuel L. Terry, of Chicago, Ill., assignor one half to Wm. Stretton, of Downs, Kans., has been granted a patent on an air-meter that will accurately measure the fluid pressure or amount of air passing through a conductor. It is especially valuable in connection with air supply pipes used for conveying fluid pressure for the operation of drilling tools and like machinery, and is also adapted for use in connection with the train-pipe of a fluid pressure brake mechanism.



The meter embodying this invention consists essentially of a rotary measuring wheel or fan housed within a suitable casing and connected with a shaft which operates the recording mechanism. This recording mechanism consists of two parallel shafts which constitute receiving and supply spools to hold a web of paper which is provided with graduations. A suitable marker is arranged to indicate upon the paper the amount of air passing the fan.

When designed for use in connection with an air brake system, the operating shaft is connected with the recorder by means of a ratchet mechanism, so that if there should be any tendency of back-pressure in the conductor it will not affect the registering mechanism.

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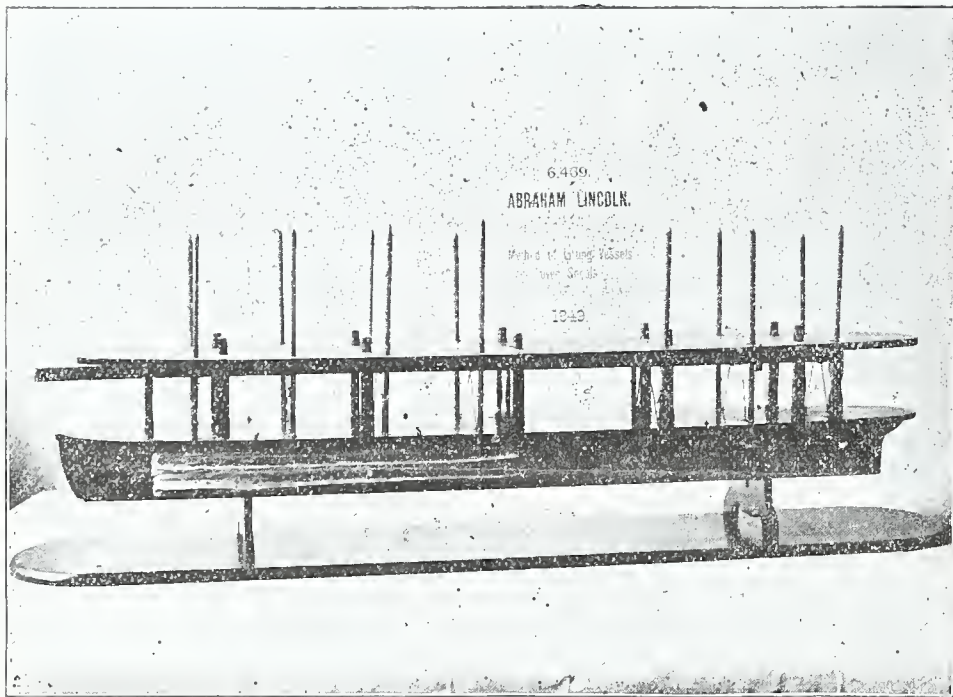


### Abraham Lincoln--The Inventor.

Resting in an out-of-the-way corner of the Union Building, now the storage place for the models of the Patent Office, is an ordinary looking model, seldom noticed by the passing visitor, and yet possessing an historical value that should place it highest among the treasures of this great department of the government. It is a simple model of a boat whittled out of wood by the hand of Abraham Lincoln. Very few people know that a patent was ever granted to this great man, but the records of the Patent Office show that in 1849 one was issued when the inventor was only known locally in central Illinois, as a successful lawyer and politician.

The invention relates to means for buoying vessels over shoals or snags. As is shown in the accompanying il-

lustration, a series of bellows are arranged on both sides of the hull and are operated by a system of rods, ropes and windlass. The idea was that when the vessel ran upon a bar or shoal, these bellows were filled with air which buoyed up the vessel, allowing it to pass over, or be withdrawn from, the obstruction. It is a noteworthy fact that it was along this same line that Hobson proposed to raise the sunken Spanish ships off Santiago,



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There seems to be a difference of opinion as to what turned Lincoln's mind in this direction. One story is that while on a trip along the Great Lakes, the boat upon which he was a passenger went ashore, and the Captain by placing barrels and planks under the keel managed to float it off. The more reasonable presumption, however, seems that it occurred to him as a result of his early experiences as flat-boatman on the Mississippi River where he became familiar with the difficulties and dangers attendant upon the navigation of that river. The incident which best illustrates his ingenuity and presence of mind in this line is described in the Life of Lincoln by Nicolay and Hay. In the Winter of 1830-31, Lincoln became acquainted with one Denton Offutt, an enterprising sort of merchant who wanted to take a flatboat and cargo to New Orleans, and having heard that Lincoln had had some experience on the river, insisted on his joining

the party, which consisted of several rather adventurous spirits. After innumerable difficulties a boat was finally constructed, and they started down the Sangamon River to New Salem, a little village which seems to have been born for the occasion, as it came into existence just before the arrival of Lincoln, flourished for seven years while he remained one of its citizens, and died soon after he went away. His introduction to his fellow-citizens was effected in a peculiar and somewhat exciting manner. Offutt's boat had come to serious embarrassment on Rutledge's milldam, and the unwonted incident brought the entire population to the water's edge. They spent a good part of the day watching the hapless flat-boat, resting midships on the dam, the forward end in the air and the stern taking in the turbid Sangamon water. Nobody knew what to do with the disaster except the "bow

oar," who is described as a gigantic youth "with his trousers rolled up some five feet," who was wading about the boat and rigging up some undescribed contrivance by which the cargo was unloaded, the boat tilted, and the water let out by boring a hole through the bottom, and everything brought safely to moorings below the dam. This exploit gained for young Lincoln the enthusiastic admiration of his employer, who afterwards declared that he would build a boat with runners for ice and rollers for shoals and dams, for with "Abe in command, by thunder, she'd have to go."

The invention never revolutionized the navigation of the Western rivers, in fact it does not appear that it was ever put into practical use, and it is to be wondered if the inventor ever dreamed, while whittling this modest little model, that it would be his task to guide the Ship of State over the dangerous shoals and obstinate obstructions that were to arise in the years to come.

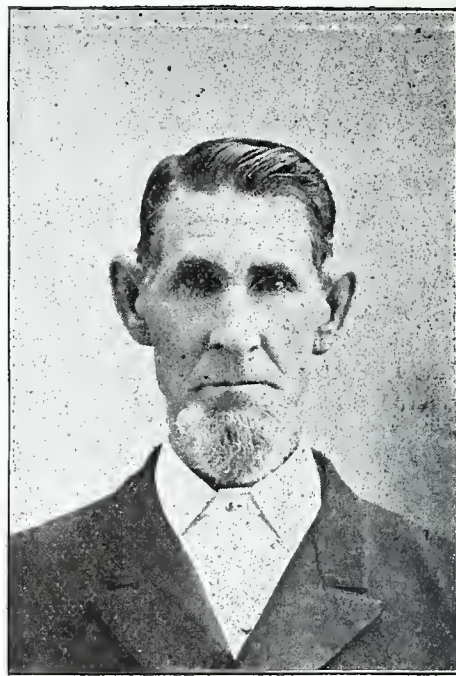
Professor Dewar's invention of the solidification of hydrogen is the conclusion of a long campaign in the course of which all the heavier gases have been solidified. At the Royal Institution London, recently the Professor surrounded a tube containing liquid air, and then by producing with a pump a vacuum in the hydrogen tube caused the hydrogen to freeze into a white opaque solid.

### SANITARY CREMATION. DIXON PROCESS.

The question of how to dispose of the kitchen and other waste of our cities has been much and earnestly discussed by sanitarians for some years past, but within the last few years has attracted more attention than ever, and in some States has been the subject of important legislation. There are few questions of more vital importance to the health of our cities and towns than the question of handling and disposing of their waste. Some of our largest, most prosperous, and best regulated cities have, up to this day, been unable to solve this important problem in a manner at all satisfactory to themselves.

For years past sanitarians have recognized fire as the ideal destroyer of the waste of our cities. The great obstacle was the cost. The ingenuity of more than one inventor was taxed with this problem. The problem was to destroy the garbage in a sanitary manner, and at a cost within the reach of the people. Year by year improvements have been made, until to-day it is demonstrated that cremation can be effected in the heart of our cities in a perfectly sanitary manner without giving offense to anyone, and at a cost less than hauling it to the suburbs, or to the water courses.

Samuel W. Dixon is the inventor of the Garbage Crematory that bears his name, and which is now in use in twenty-two of the cities of the United States. He is now sixty-eight years old and has done well with the patents he has procured. At the age of fifteen he started to learn the trade of brick layer and stone-mason, and became an expert at the business. Later he turned his attention to heating and ventilation, and in April, 1878, procured his first patent on a fire place and furnace combined. This invention was a success as a heater, but Mr. Dixon could not interest capitalists in it, and hence there were no financial

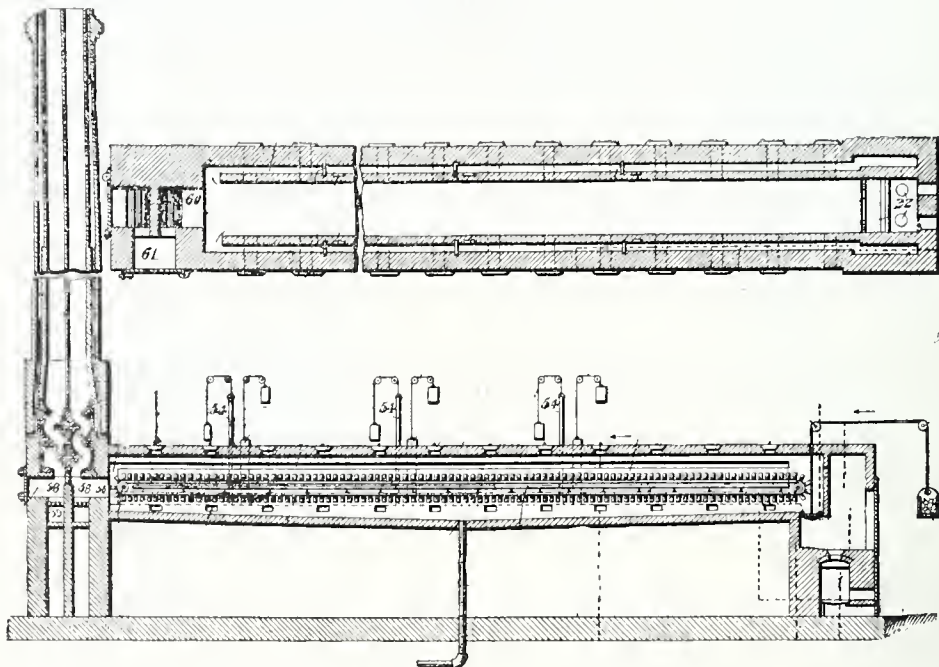


SAMUEL W. DIXON.

tary Crematory Co., which has made over 100 per cent profit on all furnaces built, charging from \$8,000 to \$27,000 for each furnace.

The Dixon Crematory is now in successful operation in many cities and towns of the United States, and is recognized by sanitary experts and boards of health as the most perfect, economical, and sanitary device in the world for the actual disposal of garbage and city waste. See the list!

Memphis, Tenn., 4 furnaces; Jacksonville, Fla., 4 furnaces; Dayton, Ohio, 4; Youngstown, Ohio, 2 furnaces; Wilmington, Del., 2 furnaces; Trenton, N. J., 1 furnace; Fort Wayne, Ind., 2 furnaces; Bridgeport, Conn., 1 furnace; Greater New York, 6 furnaces; York, Pa., 1 furnace; Charlotte, N. C., 1 furnace; Atlanta, Ga., 2 furnaces; Los Angeles, Cal., 1 furnace; San Diego, Cal., 1 furnace; Camden, N. J., 2 furnaces; Lafayette, Ind., 1 furnace; McKeesport, Pa., 1 furnace; Elwood, Ind., 1 furnace; Greenville, Miss., 1 furnace; Rapides Parish, Alexandria, La., 1 furnace; Santiago, Cuba, (United States Government,) 1 furnace.



returns to him. In 1886 he procured a patent for a tile and brick kiln which turned out to be a success in every way. Many of the kilns are in use to-day, from one to eight kilns per plant. Mr. Dixon charges \$50 per yard right for each kiln, and is still working this patent. In October, 1891, Mr. Dixon patented his cremation furnace, and in April, 1894, secured another patent for certain improvements thereon, and sold both patents to the Dixon Sani-

The above cut represents the latest garbage furnace made by Mr. Dixon, and which was patented February 27, 1900. It is not a mere improvement on the two previous patents, but relates to an entirely new process.

It provides for a thorough separation of the liquid and solid matter, and the drying of the solid matter to utilize the same as fuel for keeping up the fire in the main consuming or cremating chamber. It further contemp-



lates means for protecting the garbage platform from the direct action of the fire, while at the same time providing for an effective circulation and distribution of the heat to the garbage on the garbage-platform, whereby a thorough drying thereof by evaporation is accomplished.

Another important feature of the invention is an improved construction of platform for supporting the garbage while being dried in the evaporating chamber, and which platform not only serves to provide for separating the liquid from the solid matter, but also acts in the capacity of a supporting carrier for delivering the garbage when dried to the feeding point, where it is delivered to the main cremating or combustion chamber. There is a novel and efficient construction of scent-consumer within the stack of the furnace, to provide for the complete consumption of combustible vapors and the thorough deodorization of odoriferous gases whereby all scent incident to the operation of the furnace is entirely destroyed, and the gases which issue out of the stack are entirely eliminated of foul-smelling and poison-laden matter.

The new furnace has three advantages over the old one. First, it utilizes the garbage as fuel to run the furnace. Second, it can be run with fewer repairs necessary. Third, the scent consumer in the stack will not clog up. This furnace will save in fuel and repairs over the first one from \$1,500 to \$6,000 per year, and Mr. Dixon has good reason to believe that this patent will net him more than all the others. It was procured through the patent soliciting department of E. G. Siggers, Washington, D. C., and contains seventeen broad claims which fully cover the three important features of the invention. The number of the patent is 644,505.

## ELECTRIC SUSPENSION RAILWAY.

A double-railed line, 8.3 miles in length, with eighteen stations, has been partly constructed in Barmen Germany according to the single overhead-railway system of the Langen patent. This is, I understand, the first suspension railway for the conveyance of passengers that has been built.

The road commences at Barmen-Rittershausen and follows the River Kupper through the thickly populated cities of Barmen and Elberfeld. Beyond Elberfeld, the line extends toward the west as far as Vohwinkel, leaving the river at Sonnborn and running over the public highway to Vohwinkel.

The marginal gradient is 4.5 percent. All gradients and curves are so arranged as to avoid a decrease of speed in the main lines. The iron frame work over the river is supported by buttress piers of iron work inclined toward each other; but in the public highways the structure is supported by vertical iron columns, which require no more space than lantern posts. The cars are suspended on two rotary bogies, 26.2 feet in length. Each truck, or bogie, has two axles, between which an electromotor of 36 horsepower, at 500 volts, is arranged. The special construction of the trucks is shown in the figures. The frame surrounds the rail carrier in such a manner that the wheels can not rise from the rails and the cars cannot slip off in case a fitting break or there is some other mishap. The current is fed by a contact shoe from a rail.

The speed will be regulated in the same man-

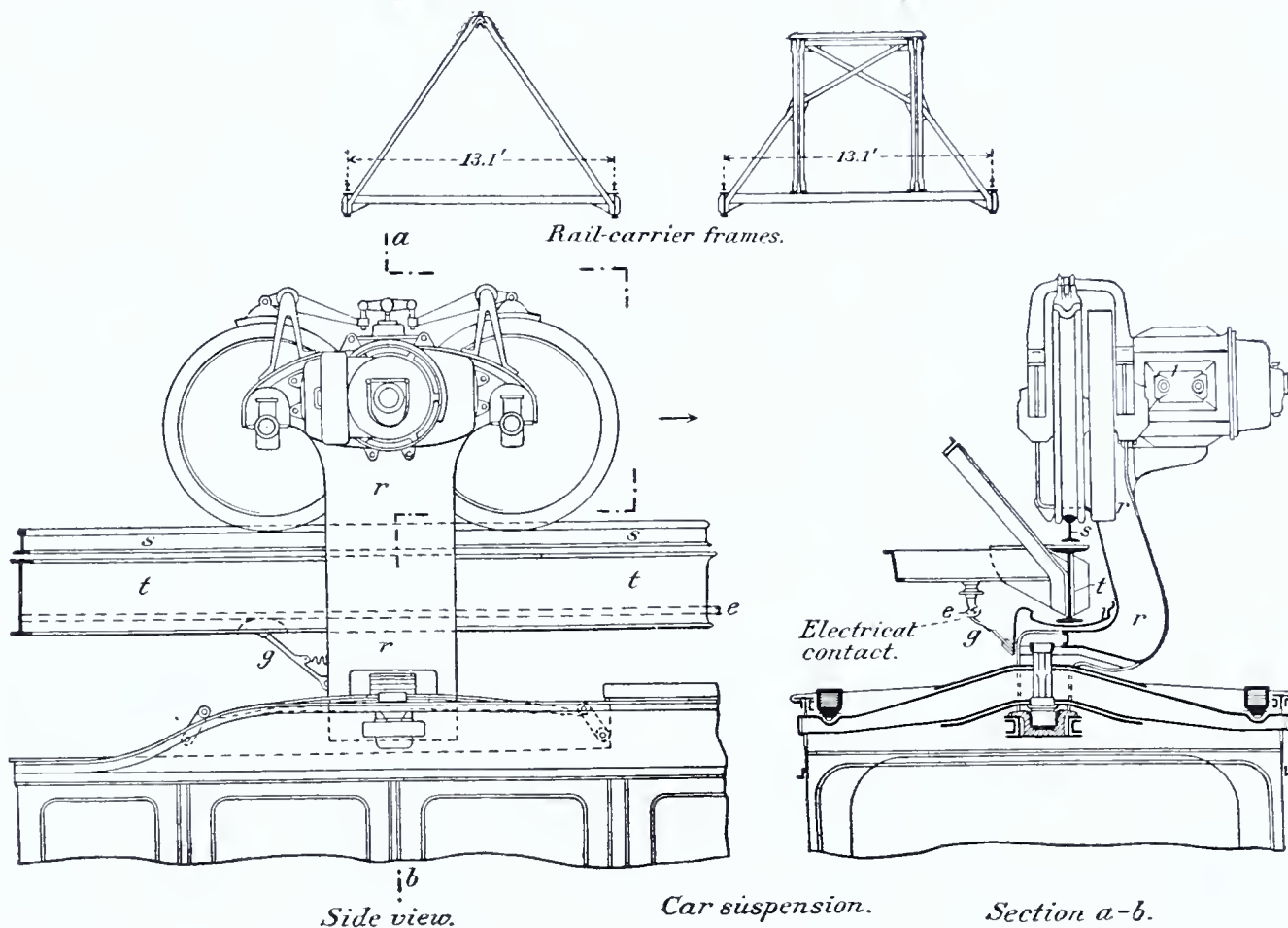
ner as in electric street cars. The traveling speed is supposed to be 25 miles per hour. It takes only from 10 to 15 seconds to start; so that, in spite of the eighteen stations of the road, an average speed of 18¼ miles per hour will be maintained. Each car holds fifty passengers and is divided into first and second class and smoking compartments. The number of cars in the make-up of a train is not limited; but at first each train will consist of one or two cars only, although the station platforms are so

inghouse pneumatic brake, operated by the motorman; (2) by a hand brake working on the fittings of the Westinghouse brake, operated by motorman and guard; (3) by an electrical brake; (4) by an electrical return-current brake, serving as a distress brake.

The rails are of the Haarmann system, installed on iron-plate slippers with a layer of felt to the rail supporters. These are made in T section and have a curved bottom with a slight play, which allows the cars to swing

the double-railed line over the river, including the piers, is only about 838 pounds to the foot; over the highway, 783 pounds. This makes the cost of construction from £200,000 to \$225,000 per mile, including the foundations and stations. Counting the rolling stock (it is intended to start a train of one or two cars at intervals of three minutes,) the cost would be about \$265,000 per mile. The underground railways of London involved an expense of about \$1,500,000 per mile.

The car station at the terminus in



arranged that a four-car train can receive and unload passengers. The speed of the trains is not dependent on the number of cars, as each car has its own motor.

The employment of an automatic block system, by which the car itself regulates the signals, allows the trains to start in either direction at intervals of two minutes. Braking is effected in four different ways: (1) By a West-

easily without running off the rails.

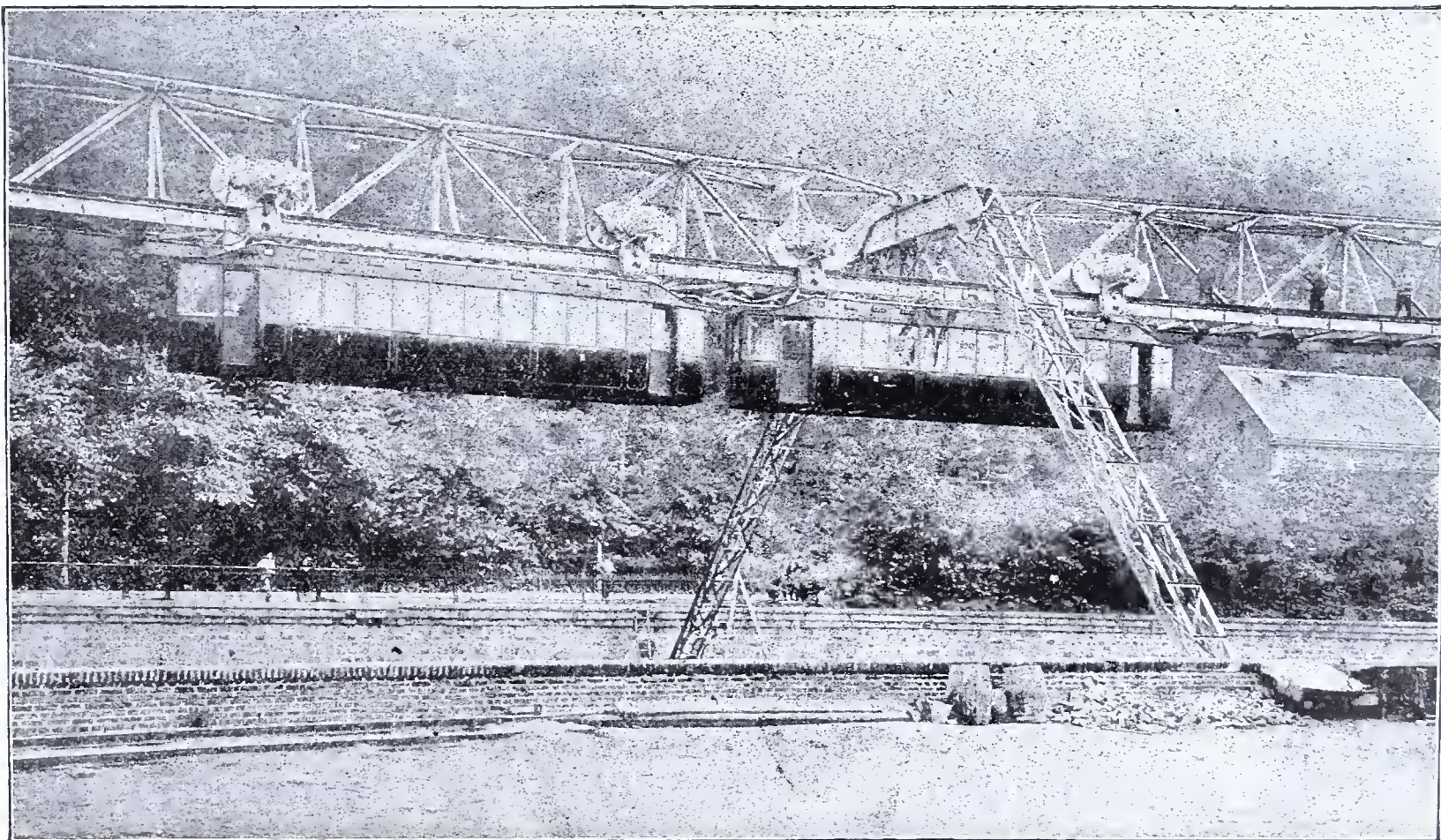
The stations are built on the same plan as those of the American elevated roads, with separate entrances for each platform.

The spans of the piers are very wide, owing to the difficulty of finding solid foundation on the river banks and to avoid interrupting traffic on the public road. Although the span averages 93.4 feet, the total weight of

Vohwinkel has eight sets of tracks, which are connected by return switches in order to facilitate the arrangement of the cars.

The railway is about half finished, and part of it is expected to be in operation in a year.—Report of U. S. Consul at Barmen, to State Department.

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### A New Automobile.

There is probably no machine more attractive to the public mind at the present time, than the automobile. As a recent addition in this line, the patent granted to John Pender of Brunswick, Victoria, Australia is interesting. The invention relates particularly to the driving mechanism and provides a construction which has neither chain nor leather belts, nor continually rotating sprocket wheels. It is operated by an explosion-engine, in which oil is the actuating agent, and is so constructed that it is applicable to any class of conveyances. All the parts are accurately balanced to reduce the vibration to a minimum, and the explosions, of which there is one to each revolution of each opposite pair of cranks, is absorbed by two pistons in each cylinder. The explosive mixture is electrically ignited, and by a simple system of crank-levers and connecting-rods a variable speed transmission gear is obtained which is most effective in action. From it, can be communicated to the main driving-axle, all speeds or variations of the same from zero to any predetermined maximum without in any way altering the speed of the motor. The maximum power for hill-climbing and

rough roads, as also all changes of speed, is obtained by the movement of one lever by the driver. By a special form of clutch-box secured to the main or driving shaft, a rotary motion is imparted to the said shaft from a reciprocatory slide moving along the engine-frame. By this mechanism heavy loads or steep upgrades are treated without any unusual labor, since the power transmitted from the motor can be regulated by a rocking lever. The wheels are so arranged upon their driving-shaft that one can over run or under run the other, and thereby allow for the major curve in turning.

### Tobacco As An Insecticide.

As an insecticide tobacco has a wide application, and its use for this purpose, it is safe to say, has been tested by every Agricultural experiment station in the country. A brief summary of the methods of application and the results obtained at a number of stations are here given.

Tobacco decoction was used with effect by the New Jersey Experiment Station against attacks on flea beetles on potatoes, plant lice on rose bushes and chrysanthemums, the wheat louse, the larvæ of the rose tortricid, and the rose slug, but its effects were not satisfactory when used for the larvæ of the elm leaf-beetle, hairy caterpillar, rose chafer, and striped beetle. Coarse-

ly ground tobacco dust was ineffective when applied on dry plants, but had some effect on moist plants. Finely ground tobacco dust was much more effective. The addition of carbolic acid to tobacco powders increased their efficiency fully 50 per cent. Tobacco dust put into the soil was successfully used in 1890 by Dr. E. F. Smith as a remedy for the peach louse; either tobacco decoction or tobacco dust was ineffectual as a remedy for the rose chafer. It was found that the horn fly succumbed very readily when brought into contact with tobacco powder.

The Ohio Station found that dusting lettuce, roses, and other plants grown in greenhouses with tobacco powder destroyed the plant lice with which they were infested.

At the Michigan Station tobacco decoction was successfully used to free currants, gooseberries, and apple trees from plant lice, and cherry, plum, and pear trees from slugs. It also proved effective against striped flea beetles and cucumber flea beetles.

Experiments conducted at the Missouri Experiment Station showed that applications of tobacco dust were effective in preventing depredations by the woolly aphids of the apple or apple-root plant louse.—From Report of U. S. Department of Agriculture.



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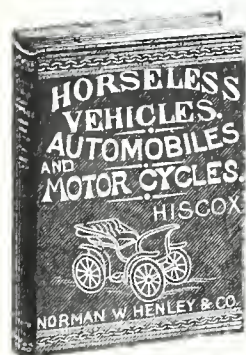
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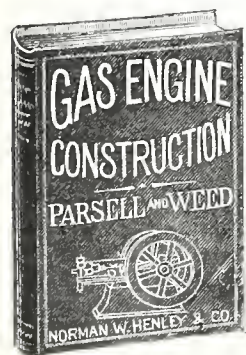
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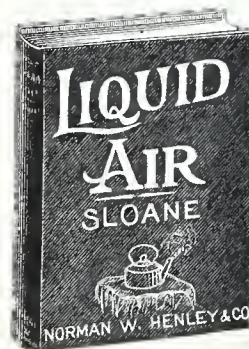
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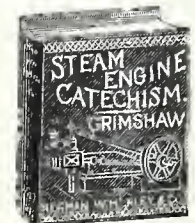
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GRANTED FOR INVENTIONS,  
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Advertising device.....L. J. Long  
Air brake.....A. L. Watkins  
Animal trap.....W. B. Hargan  
Animal trap.....H. Toland et al  
Aparejo.....H. W. Daly  
Back pedaling brake.....2 pats.....C. H. Melvin  
Baling press.....M. J. Gregory  
Ball and socket self adjusting joint for pipes or tubes.....G. Harter  
Band cutter and feeder.....J. N. Wilson  
Barium oxid. Apparatus for making.....W. Feld  
Barrel swing.....J. E. Kelly  
Barrel ventilator.....J. M. Hustermann  
Basket machine.....W. Jackson  
Battery connection.....G. F. Atwood  
Battery envelop. Storage.....E. A. Sperry  
Bedstead attachment.....J. A. Martin  
Bell striking apparatus. Electric.....L. D. Tillyer et al  
Belt wheel. Grooved.....W. R. Towse  
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Bicycle handle bar.....J. Ryan et al  
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Binder stop. Self.....O. H. Adams  
Boiler cleaner.....T. M. Welshons  
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Pump rods. Repair apparatus for surface oil.....R. E. Smith  
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Race horse starting device.....A. S. Miles et al  
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Railway order recorder.....W. R. Thomas et al  
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Railway system. Underground electric.....J. B. Larkin  
Refining engine.....C. E. Torrence  
Refrigerator car lock.....T. B. Kirby  
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Wire stretcher.....W. S. Brown  
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Wrecking apparatus.....E. Niehoff  
Wrench.....E. R. Allen

Canadian Patents may now be obtained by the inventors for any of the inventions named in the foregoing list, provided they are simple, at a cost of \$30 each. If complicated the cost will be a little more. For full instructions address E. G. Siggers, 918 F Street, N. W., Washington, D. C. Other foreign patents may also be obtained.

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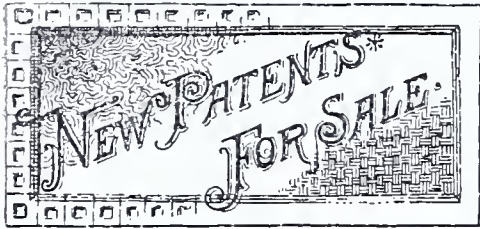
Mr. John M. Murphy of Torrington, Connecticut, has recently patented an improvement in the third rail system for electric railways.

In surface-contact-railway systems having a third rail formed substantially in the nature of a continuous member, the third rail is made fast by spiking in a manner similar to the securing of the tread-rails, the sections constituting the third rail being insulated from each other by spacing blocks. This method of mounting the third rail has been found objectionable and unreliable on the score of expense and danger of short-circuiting, and the present invention seeks to provide a means of constructing the conductor or third rail in a manner that will make it lasting under all conditions of traffic, that will reduce the danger of ground short-circuiting, and that will admit of securing the feeder-wire in close proximity to the third rail, whereby the connection between the switches, the third rail, and the feeder-rail is the more stable and economical, and a more complete and slightly construction of the third rail for use on block or concrete paved thoroughfares is provided.

It comprises a trough having a stone base upon which rests the rail. This trough is filled with plastic cement, which when hardened securely binds the rail in place and at the same time it acts as an insulator so that the danger of short circuiting is reduced to a minimum, a smooth upper surface is presented and the feeder wires may be imbedded in the filling close to the rail.

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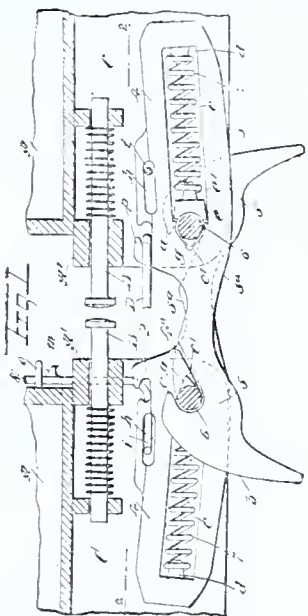
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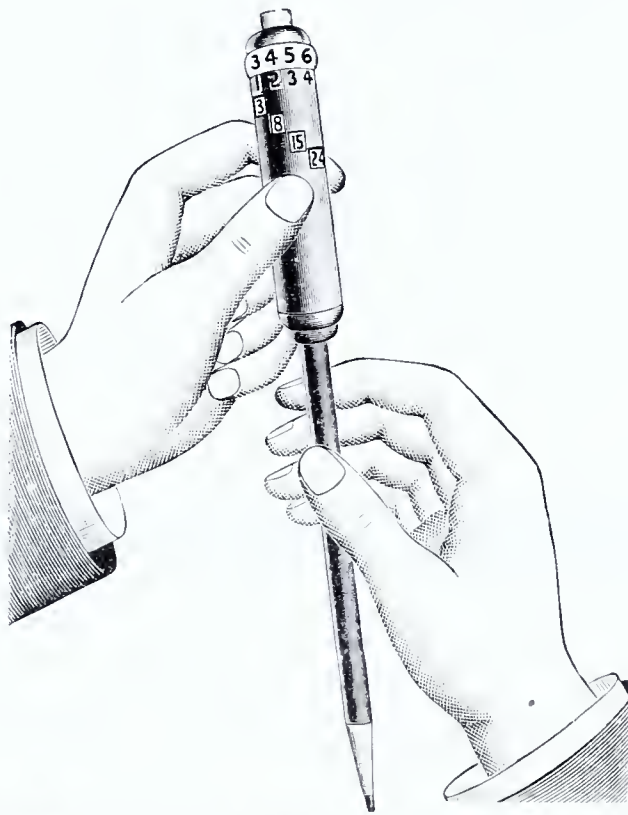
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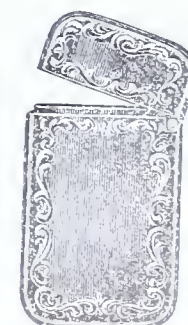
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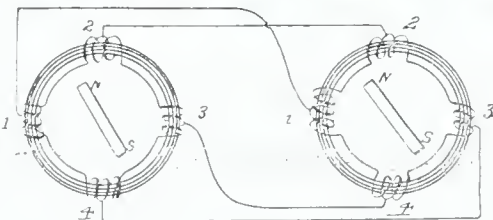
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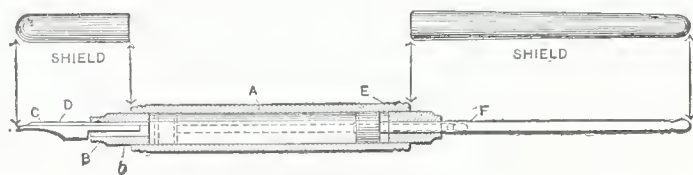
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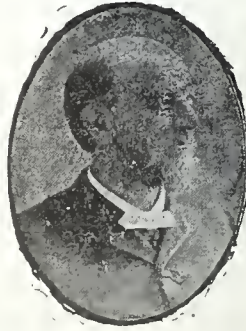
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Considering the fact that over 2,000 patents, or about 65 per cent of the total issue of the Canadian Patent Office, are annually granted to United States inventors, surprisingly little is known in this country of the methods of that institution, or of the general laws that govern the issuance of patents in the Dominion.

The Canadian Office is presided over by a Deputy Commissioner, his immediate superior being the Minister of Agriculture, who is *ex officio* Commissioner of Patents. It thus differs from our own office, which is under the Secretary of the Interior.

Canadian patents are granted for 6, 12, or 18 years. Patents granted for the shorter terms may be extended by paying a government tax of \$20 for each period of six years, provided the application for extension is made before the expiration of the period for which the patent was originally granted. If there is an earlier foreign patent, granted on the same invention, the Canadian patent will expire with the end of the term of the foreign patent. Therefore, if the inventor applies for and secures a United States patent first, the Canadian patent will only run as long as the United States patent is in force. As, under present United States law, the existence of a prior foreign patent

does not shorten the term of the United States patent, the best plan is to obtain the Canadian patent first, making application for a six year term, and at the end of that time, if no money has been made on the Canadian patent, it may as well be permitted to expire.

The government fee for filing an application for a six-year patent is \$20, but there is a provision in the law which allows a rebate of \$10 should the application for patent be refused; so that, on the rejection of an application for a Canadian patent, the inventor only loses one half of his govern-

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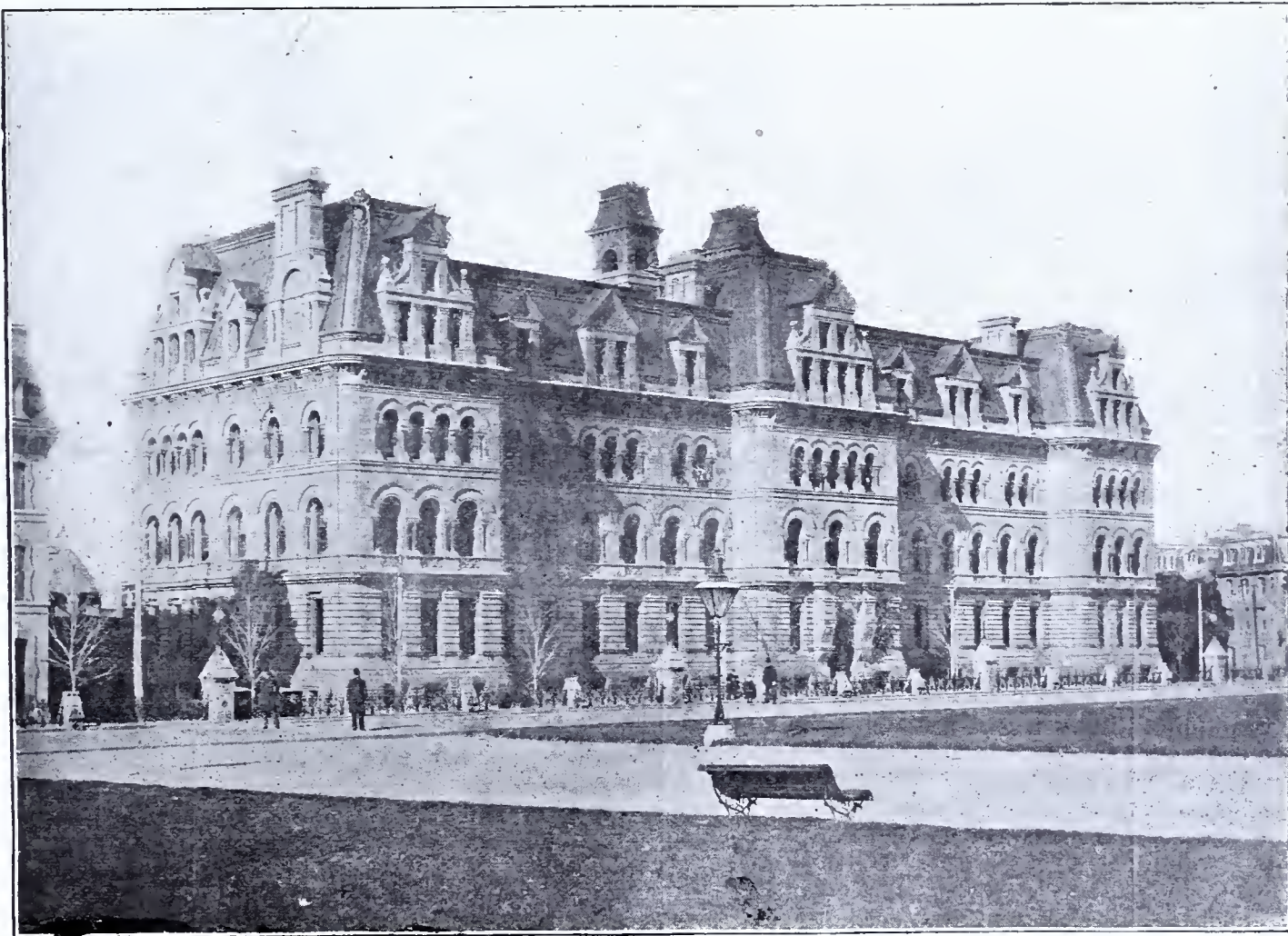
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CANADIAN AGRICULTURAL DEPARTMENT, CONTAINING THE PATENT OFFICE.



by compulsory process and require them to testify on oath and to produce such articles or information as may be necessary. The fees to the arbitrators are a matter of agreement with the applicants, each of these paying his own selection and the two uniting in paying the third. No time limit is set for the selection of the arbitrators nor for their making their award, nor is there any provision in case they are unable to reach a decision.

While the plan has the merit of simplicity, it is doubtful if it would serve to establish a stable practice, such as has been built up in the United States Patent Office. Since the arbitrators are not required to be men of special legal or patent learning, it is conceivable that each inventor should select a personal friend or ally as his member of the arbitration board, and it is not to be expected that such a tribunal, changing with each case of interference, could formulate and lay down settled principles of law governing decisions in such contests.

The Canadian Patent Office does not issue printed copies of patents like those published by the United States, and the applicant is required to furnish duplicate copies of all papers to be filed, one set of which remains in the Patent Office, while the other is attached to his patent grant. When any one desires a copy of a Canadian patent, it is furnished by sending a blue print of the drawing, made from the office copy and a typewritten copy of the specifications, the charge for which is four dollars.

Once a month the Canadian Office issues a "Patent Office Record," which corresponds to the United States Patent Office Gazette, containing copies of the claims, with one or more figures of the drawings of the things patented, together with information showing the dates of filing, the dates of issue, the lengths of term for which the patents have been granted, and the names and residences of the patentees. It also contains lists of copyright certificates issued and trade marks registered. It is the intention of the Office in the future to add a list of design patents granted. The publication is supplied to foreign patent offices in exchange for their reports, and it is also sent, without charge, to a large number of free libraries in Canada and in foreign countries, with the object of diffusing amongst the public the information therein contained. Its subscription price is \$2 per annum.

By Section 4900 of the United States Revised Statutes, it is made the duty of a United States patentee to give due notice to the public that his invention is patented by affixing to the article the word "Patented," together with the year and date the patent was granted, or, when the character of the article will not permit this to be done, by affixing to the package containing it a label giving a like notice. On failure to do this, no damages can be recovered by the plaintiff in any suit for infringement, unless it shall be proved that the defendant was duly notified of such infringement, and continued after such notice, to make, use or sell the article patented. The law provides no penalty, however, for failure to mark a patented article.

The Canadian law, on the other hand, require all patented articles, or packages containing such articles, to be marked or labeled "Patented," giving the year in which the patent was granted, and provides for imposing a penalty of \$100, or imprisonment not exceeding two months, for any one selling or offering for sale, articles or packages not so marked.

The government of Canada may, at any time, use any patented invention by paying to the patentee such sum as the Commissioner of Patents may report to be reasonable compensation for the use of the invention. From his report no appeal is allowed. In the United States a patent is private property, and the government cannot, after its issue, make use of the improvement any more than a private individual, without the license of the patentee or without giving him due compensation, which is to be determined by a proceeding instituted in the Court of Claims.

The United States Patent Act of 1832 required aliens to introduce any invention patented by them into public use within one year from the date of issue, otherwise it became absolutely void without resort to legal process. It also became void if it ceased to be publicly used in the United States for six months after it had been introduced. This act was repealed in 1836 and a foreign patentee may now obtain a patent on his invention in the United States, make the goods in his own country and ship them to this country, marking them with the date of the United States patent. This can be carried on throughout the entire term of the United States patent, and the courts of the United States will protect the alien manufacturer from infringement on his rights. Of course, in such cases, the foreign patentee has to pay a penalty for the manufacture of his invention abroad in the shape of the regular duty imposed at the custom house.

Such a practice would not be tolerated in Canada, where although patents are granted for six, twelve or eighteen years, they may be declared void under certain contingencies before the end of the term. The law provides that, for a period of one year, any invention protected by a Canadian patent may be shipped from the United States or elsewhere into Canada and sold there after paying the usual duty, but after the expiration of that time, unless an extension is granted, the importation must cease; further, after two years, steps must be taken to manufacture the articles in Canada, unless an extension is granted. If either of these conditions is violated the patent may be declared void. These provisions, if strictly enforced, would work great hardship, but fortunately for patentees, neither the Patent Office nor the courts of Canada are disposed to be rigid about them. In the first place, the Commissioner of Patents is given the right to extend the importation period for one year on the patentee making proper application before the expiration of the original period, and the manufacturing period can be extended for a number of years by applying for an extension each year, provided such applications for extensions are made in time.

In the second place, the courts are

extremely liberal in interpreting the law. In the case of Barter vs Smith, it was proved that none of the patented machines had been put up in Canada within the time prescribed, and that there had been some importation after the authorized period, yet the general conclusion arrived at was that the respondent, having refused no one the use of his invention, and the importation, assented to by him, having been inconsiderable, and inflicting no injury on Canadian manufacturers, and having been so countenanced, not in defiance of the law, but evidently as a means of creating a demand for the invention, which the patentee intended to manufacture, and did, in fact, offer to manufacture in Canada, he had not forfeited his patent. The real meaning of the law was plainly held to be that the patentee must be ready either to furnish the article himself or to license the right of using, on reasonable terms, to any person desiring to use it. As long as the patentee has been in a position to hear and accede to a demand to license, and has not refused a fair bargain proposed to him, he has not forfeited his rights. This matter is ably discussed in *Ridout on Patents* from page 369 to 399.

The intention of the legislature, as shown by the history of the legislation, was evidently to guard against the danger that Canadian patents, granted to aliens, would be used to secure the Canadian market for foreign patents to the detriment of Canadian industry. This is evident from the fact that, as the right of taking patents was extended, the remedy against the dreaded danger was made more ample. At the same time, however, the power of administrative officers to extend the period was broadened in order to prevent a too strict application of the law. In the United States the patentee has an exclusive interest in his patent, and is under no obligation to manufacture it, nor utilize it in any way, nor even to license it to any one. Indeed, he can, and often does, play the part of a dog in the manger, and refuse to do anything with the patent himself, or permit any one else to use it. This cannot be done in Canada.

These restrictions on the manufacture and importation of inventions patented in Canada, are to a certain extent a clog and hindrance to invention without effecting much good or greatly promoting home manufactures, and it is to be hoped that they will soon be done away with and the foreign patentee put on the same footing as the United States Patent Laws have placed citizens of Canada. From the fact that sixty-five per cent of the Canadian patents granted are issued to citizens of the United States, it would seem that a proper consideration for the welfare of those who supply the most revenue to the Canadian Office would dictate the removal of these onerous sections.

The illustration of the Agricultural building which accompanies this article was furnished by the courtesy of the Hon. W. J. Lynch, Chief Clerk of the Canadian Patent Office. While the building is not as large as our Patent Office, it is much finer from an architectural point of view.

### German Patent Office.

Though the German patent office cannot compare with that of the United States, yet it is doing good work and seems to be faring well. During 1899, 21,080 applications for patents were filed, of which, however, only 7,430, or about 33 per cent, were granted. Considerably more than half of the applications were refused because the subjects lacked novelty or patentability. Since the establishment, in 1877, of the Imperial Patent Office, 263,447 applications have been made for letters patent and only 109,190 granted.

Besides the regular patent the German laws have provided, since 1891, for a so-called "Gebrauchsmuster," giving certain new articles the right of being protected against imitation for three years. This is considerably cheaper than the patent, though in effect similar to the latter. Considering that during the nine years of the existence of the Gebrauchsmuster laws not less than 140,622 Gebrauchsmuster letters have been granted, as against 109,190 letters patent during twenty-three years, it seems that the passage of the Gebrauchsmuster laws has filled a long-felt want.

The trade-mark laws have existed since 1894. Here also the applications are larger than the marks granted. In 1899, 9,761 applications were made and 9,448 granted. Since the establishment of this branch of the Patent Office 41,551 trade marks have been registered out of the 63,275 applied for.

The total of all kinds of protection granted by the imperial Patent Office during 1899, either as patent, Gebrauchsmuster or trade mark, was 52,672. The revenue derived from the issuance of this protection reached the sum of \$1,100,710. Deducting therefrom the expenses of the entire office, amounting to \$480,818, there remained \$617,659 for the general imperial treasury.

The Gebrauchsmuster is a peculiar affair and has prevented many an American article from being introduced and handled in German markets. The Germans are usually quick in knowing a good thing when they see it. So soon as they, or their agents at New York or Baltimore, have discovered a new article that can be manufactured equally as well in Germany, and which it is feared might be pushed by the Americans themselves on the German market, they get a Gebrauchsmuster on it, and by the time the Americans are ready to sell the article in Germany, they find that they are prevented from doing so by the Gebrauchsmuster. The Gebrauchsmuster is essentially a protection for home industry, no matter where the article to be manufactured may have originated. The formalities require no oath or statement as to the origin of the invention, but merely a declaration that the article has not yet been offered freely on the German market.

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## PROGRESS OF INVENTION.

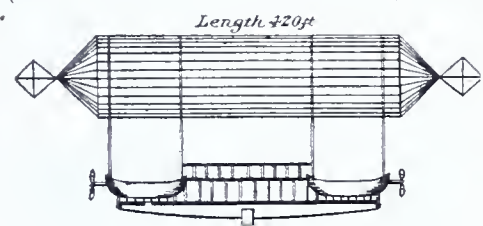
### Aerial Inventions.

**THE ZEPPELIN FLYING MACHINE:**—Flying machines are of two principal types—the flying machine proper, which lifts, sustains and propels itself in the air as a bird does, and the dirigible balloon, which depends on gas to sustain itself and which is directed and controlled by some sort of machinery. Up to quite recently, the advocates of the former type held the floor and made very gratifying progress. The invention of Professor Langley of the Smithsonian Institution in Washington seemed particularly promising and at one time it was supposed that the problem of aerial flight had actually been solved.

But latterly nothing has been heard from the inventors of this type of machine, while the balloonists have been coming to the front. The offer of the Aero Club of Paris, of \$40,000 for a successful dirigible machine of either type which should be under perfect control, has greatly stimulated inventors and a number of costly machines have been built. The latest and most successful of these seems to be that of Count von Zeppelin, which has just been tested at Lake Constance, Switzerland. It was sent in the air to a height of half a mile, and while at that attitude was maneuvered as easily as though it had been a ship in the water. It obeyed the rudder and propellers completely, running with or against the wind with equal success and cutting circles in the air at the will of the operator. The machine traveled thirty-five miles from its starting point.

The balloon part of the machine consists of a 24 sided tube, 420 feet long and 37 feet in diameter, divided into sections by 16 aluminium polygons set vertically to its longitudinal axis. Between these polygons are set 15 balloons, each 26 feet long, entirely separate from each other. Two smaller pyramidal balloons cap the two ends. Each of the 17 is filled separately, and if by accident any one or two of them bursts or leaks, the carrier power and utility of the balloon as a whole are not endangered or sacrificed.

Under the balloon, and attached firmly to it by strong aluminium bars are two gondolas, also of aluminium, having under them large spiral springs (not shown in the illustration) which



COUNT ZEPPELIN'S DIRIGIBLE BALLOON.

prevent jarring the entire machine when landing after an ascension. The two gondolas are connected by a bridge.

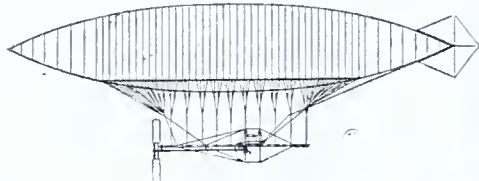
In each gondola is a 15 horse-power motor. Benzine is used as fuel, as, despite its great inflammability, it is found to be the most practical. Electricity was not employed on account of the weight of the machinery.

Connected with the motors are four large aluminium screw propellers, two placed at the forward end and the

other two at the rear.

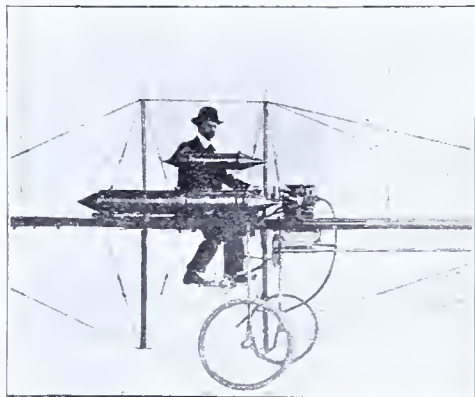
The balloon is steered by a rudder at either end, consisting of a framework covered with balloon cloth, which can be moved to the right or left or up or down. A weight which slides along a rope is attached to the under side of the gondolas and the bridges. By moving this forward or back, the center of gravity of the machine is changed, and it points up or down and consequently is driven up or down by the propellers.

**THE DUMONT DIRIGIBLE BALLOON:**—On the same general plan is the airship just completed by M de Santos Dumont. It consists of a cigar shaped



THE DUMONT'S AIR SHIP.

balloon, with a capacity of nearly 12,000 cubic feet, which supports a motor giving 10 horse power, which runs an aluminium propeller. The mechanism is about 17 feet below the balloon. The motor is of the two-cylinder type: the spark for ignition is produced by an induction coil. It gives 1,500 revolutions per minute, the speed being regulated by gearing connected with the shaft of the screw. The illustration shows M. de Santos Dumont mounted upon the saddle: he uses his



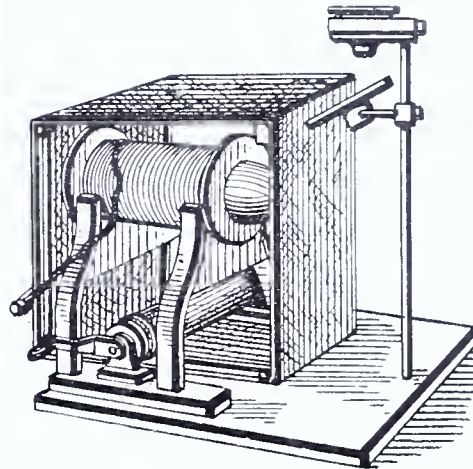
DETAIL OF DUMONT'S AIRSHIP.

feet to start the motor and also to work the guide-rope and the weights used to balance the air ship and to cause it to ascend or descend: the hands are thus left free for the other manipulations. The whole apparatus, including an operator of average size, weighs about 775 pounds. The balloon is of a special type, having an inner and an outer air chamber.

### Mining Inventions.

**MAGNETIC GOLD SEPARATOR.**—In scarcely any line of work have improved methods paid so well as in gold mining. Ore that the miner would have passed by as too poor to pay for working even ten years ago now yields large profits by the use of improved methods, and even "flour gold" is made to pay dividends to the lucky owners of the land where it occurs. The cyanide process revolutionized quartz mining, and now, if the claims made are to be depended on even to only a limited degree, a new means for dealing with iron and gold has recently been invented, which is as far superior to present methods as they were to ancient ones. It is the invention of Prof. Elmer Gates of Chevy Chase, Md., and will sift out the fine powdery gold and iron from magnetic sand at a cost

so low that it is not worth being considered. Practically all the sand in the United States away from the seashore contains both iron and gold, usually in small proportions, but in some localities in very heavy ones. There are miles upon miles of sand, for instance, where the iron forms about one third of the sand by weight but has heretofore been absolutely worthless on account of the great cost of separation. Prof. Gates' machine, it is said, will treat this sand at almost nominal cost, sifting out the pure iron, and, what is still more important, saving also the fine flour gold that is almost always found in company with it.



PROF. GATES SEPARATOR.

One of his machines, for instance, which costs \$5,000 to build, has a capacity of 1,000 tons of sand every ten hours, and will yield 350 tons of pure iron and \$800 worth of gold from such magnetic sand as exists at many places in the United States, and which has hitherto been considered worthless. The machine which does this consists of a magnetic honey-comb, over the ends of which an endless band travels downwards. Against the other face of this the magnetic sand is poured. Naturally the iron tends to be held by the magnet and the sand to fall. But so finely subdivided is it that, in practice, the sand clings to the iron dust and would not fall at all under ordinary circumstances. But as the cloth moves, it carries the iron particles away from one cell of the honeycomb towards another. After a while the attraction of the sides of the second cell causes the particles to jump to it. When this is repeated a few thousand times, as it must be in a second or two when travelling over the face of the comb, each particle of iron has "danced" off all the particles of sand adhering to it and has let them fall to the ground, while it has clung to the cloth until carried by it beyond the attraction of the magnets, when it falls into a bin. The gold, which always exists in magnetic sand, does not fall with the sand, but for some unexplained reason clings to the iron and is carried off with it. It is however, readily separated by a later process. The iron produced by this is absolutely pure and very valuable, selling readily for from \$8 to \$15 a ton, according to the market.

**COPPER MINING:**—Rich rewards are waiting for anyone who can devise some method or process by which the present heavy waste in copper mining can be done away with. It has been demonstrated through a series of carefully made assays that two thirds of one per cent of the copper contained in the ore passed through the mills of

the Calumet and Hecla mines of Michigan escapes in the tailings. The loss amounts to only eight pounds of copper to each ton of ore worked, but it aggregates \$1,500,000 a year at the present price of copper. The same is true of other mines, and it is obvious that the owners would hail any improvement in the methods. A somewhat similar saving was effected some years ago by a genius who discovered a simple process of treating the water which was continually drained away from the big copper mines in Montana, and which for years had carried off fortunes in solution.

**GERMAN PRIZES FOR LAMPS.**—Vice-Consul-General Hanauer, of Frankfurt, reports that the Association of German Alcohol Manufacturers has offered prizes aggregating \$2,856 for an improved glow-light lamp and a burner for cooking purposes. Models of competing lamps using alcohol must be sent in by December 1, 1900.

A complete X-ray apparatus was brought into a London court the other day, to show the judge exactly how the wire imbedded in the rubber of a Dunlop pneumatic tire acted when the tire was inflated. It was an infringement case and the demonstration was a success.

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## MARINE INVENTIONS.

**A FLYING BOAT:**—This is the name by which the river men have christened a curious contrivance which has been launched on the Potomac at this city and will soon be given a series of tests. It is the invention of W. B. Motheral, of Iowa, who has patented it. Strictly speaking, it is not expected to fly at all but merely to skim over the surface of the water, being aided to do so by having air, under pressure, forced through the bottom of the hull.

Mr. Motheral, in describing his invention, says that water friction is materially reduced by discharging air under pressure at all points of water contact, thus minimizing the resistance by the interposition of a sheet of air. As air friction is materially less retarding than water friction, he claims that his "flying" boat will attain a high rate of speed. Further to accomplish his purpose, the superstructure of the boat is cuneiform, tapering from the stern to the bow, which is pointed on all faces exposed to the air. The bottom of the boat is flat and perforated with carefully arranged apertures through which the air is forced under pressure. A second or inner bottom is provided to guard against swamping and to furnish a flooring for the lower deck. The stern curves downward to a slight extent to increase the pressure on the water at that point and to induce a rise of the bow. A series of

en, if the model should prove successful and should not be too costly for use. There is little doubt that the air cushion will lessen friction and reduce fuel cost for propulsion, but this may be counterbalanced by the cost of producing the requisite air pressure.

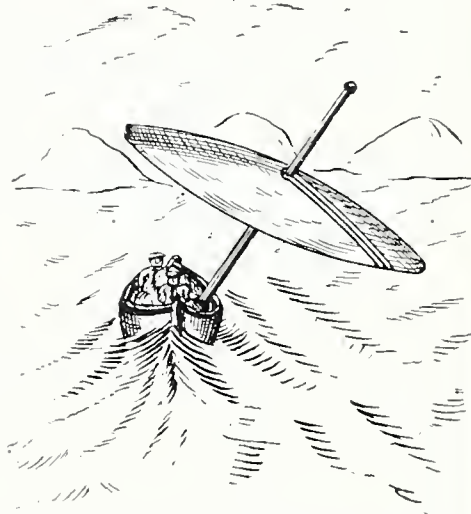
**NET BREAKWATER:**—An Italian gentleman, Baron Benvenuto d'Alessandro, living in Paris, has invented a new method which he claims is more efficient than the use of oil, for protecting vessels at sea, entrances to harbors, light-houses and so on, from the force of waves and surf. His invention consists of an unsubmergible floating net retained on the surface of the water by means of out-riggers when used to protect vessels in storms at sea, and by buoys when used to protect light-houses, hydraulic works in construction, entrances to harbors and so on. His idea is that if the surface of the sea is covered with a thin, flexible, light, and floating body of whatever nature, the part covered forms a crust under which the imprisoned mass of water can not move so freely as the surrounding body of uncovered water, the result being to compel even the most violent waves to pass under it, become flattened out, and lose much of their force.

The net used in recent experiments was made of a thin hemp fiber, knitted in square meshes of about one and a half inches, and waterproofed by a

is, however, only used when the net is anchored. For the protection of vessels at sea, the net is made solid.

The illustration below shows the dimensions in metres of the net used in the experiments and the arrangement of the buoys by which it was held in position.

**UMBRELLA SAIL:**—Extraordinary things are claimed for a new sail for a boat, known as the "umbrella sail" by reason of its appearance. It resembles



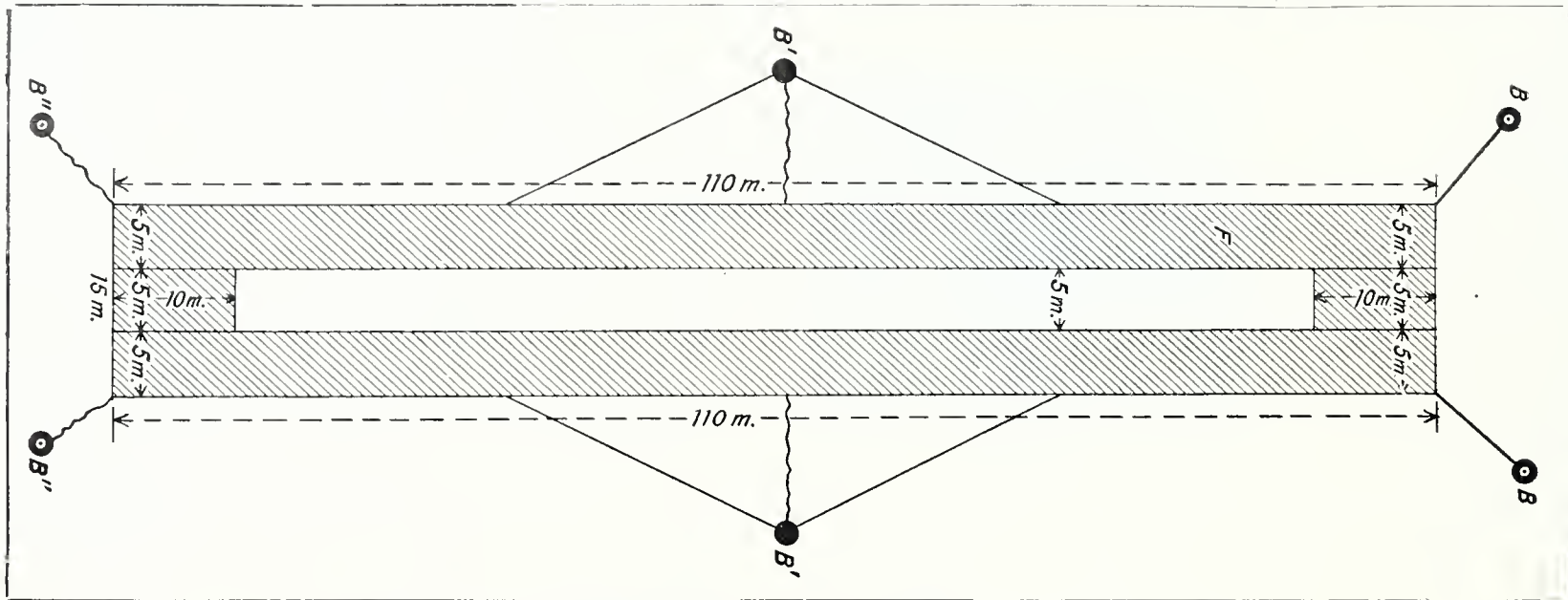
nothing so much as a huge umbrella set on the mast as a handle, although as a matter of fact, it is made in two sections, each of which is furled by closing it like a fan and then dropping it to the side of the mast. The latter is not stationary but is set in a ball socket so that it can be inclined in

and keeps perfectly dry, no matter how strong the wind may be. No statements are available in regard to its speed.

**RAISING SUNKEN VESSELS:**—The simplest method of raising sunken vessels consists of using the buoyant force of the air contained in chambers hermetically sealed. With more difficult tasks, special apparatus must be used. A writer in a French chemical journal suggests simplifying the process by generating the necessary buoyant gas below water. Experiments with calcium carbide in this direction have been made by a French engineer with such success that a company has been formed for the purpose of using acetylene in raising sunken vessels.

## TEXTILE INVENTIONS.

**NITRIC ACID TREATMENT:**—For a long time it has been known that the treatment of yarn or of texture with strong nitric acid gives it the lustre and touch of silk and makes it rustle like that material, while it increases its absorptive capacity for bleaching and coloring materials. The treatment could be applied to cotton, wool and to other materials, were it not that under it, the materials contract strongly. In the case of cotton the contraction may amount to as much as fifteen per cent. F. W. Scheulen, of England, claims to have found a way of meeting this difficulty. The yarn



NET BREAKWATER USED AT HAVRE.

apertures are located along the sides and around the stern to lessen water friction at those points by the ejection of air under pressure.

The idea could not be applied to round bottom boats without adaptation, but this would of course be giv-

solution of powdered cork and pure rubber. It was constructed with an open space in the center, numerous experiments having shown that the surface of the water in the free space was always calm, as if actually covered by the net. The open space

any direction. The umbrella sail is not set at right angles to the mast but with a slight tilt up on the lee side. It is not circular but elliptical in shape. It is claimed that actual tests have shown that a boat with this rig travels always on an even keel

to be treated is placed over two porcelain rolls. No stretching is applied, but the contraction is prevented. After the nitrating, follows washing with water. When taken off, then the fibre proves to be not only not contracted, but on the contrary slightly

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elongated. The effect is in a certain sense the opposite of the mercerization process. This method, if successful, should come into general adoption.

**ARTIFICIAL COTTON:**—Somebody in France has invented artificial cotton, which, however, would seem from the description of its manufacture to be too costly for use. Short pine logs, free from all faults, are split into small splinters, which are treated in a large cylinder of copper, lined with lead. The wood is treated first for six hours with steam, and then for thirty-six hours with soda bisulphite, under a pressure of 43 lbs. The resulting pulp is washed, bleached, and compressed. It is then heated again and mixed with zinc chloride, hydrochloric acid and acetic acid, to which some castor oil, casein and gelatin are added. The pasty mass is highly compressed by a piston and forced through a die, from which it emerges as a thread. The threads are steeped in soda, dried on cylinders, passed through cold water to make them firm and wound on bobbins. They look very much like cotton. There follows impregnation with tannin, and the artificial cotton can then be woven, dyed, and handled just like ordinary cotton.

**PERMANENT LUSTRE FOR COTTONS:**—It has always been easy to finish cotton piece goods so as to give them a lustre, but heretofore this has not been permanent, vanishing when the fabric was damped or in the making up of garments. A new method has now been devised by which, it is said, this is rendered permanent. First, the fabric is prepared in the ordinary way; then it is damped uniformly, preferably by "saturated" steam. This, it has been found, can be conveniently done during the time the fabric is passing through a stretching-machine, such as is used in one of the stages of finishing. The folded fabric is put between damp press papers and placed between the plates of an ordinary hydraulic press, which are heated by steam, and the whole subjected to great pressure, after which they are taken out of the press, the damp press papers removed and the cotton fabric wrapped in a thick fold of dry cotton cloth. The two are then placed in the steam-heated hydraulic press and subjected to heat and pressure for a period varying according to the thickness or weight and quality of the fabric on which the lustre is to be permanently fixed.

**ARTIFICIAL SILK:**—Artificial silk has been such a success that only its cost seems to stand in the way of its general adoption, and this it is hoped will soon be lessened by new chemical methods. Its great gloss seems to have captivated the public taste, and it looks rather as if the fashion were likely to last. It is pretty and durable, provided it is protected from dampness. But the splendid lustre seems to cover all drawbacks. Exorbitant prices are paid for specimens, not otherwise superior to the natural material. There are other substitutes for natural silk facings, but they lack the distinguished gloss and have little chance with the world of fashion.

**BLEACHING COTTON:**—Consul Hughes at Coburg, calls attention to Professor Koechlin's method of bleaching

of cotton by passing them through a bath of water, lime, and bisulphite of soda. They are then steamed for an hour or two under a pressure of from 1 to 2 atmospheres or are boiled, rinsed again, and dried. The bisulphite can be replaced by hydrosulphite of lime. Another process is to subject the goods for six hours under a pressure of two-thirds of an atmosphere to a solution composed of water, dry caustic soda, soap, calcined magnesia, and peroxide of hydrogen; then rinse, sonse, rinse again, and dry. The white obtained is said to be much better than can be had with hypochlorite, and, best of all, does no damage to the fibers or fabric.

#### METAL INVENTIONS.

**HARD SOLDERING CAST IRON:**—While the hard soldering of wrought iron with various alloys of copper presents no difficulty, inventors have long sought for a method by which the same results can be reached with cast iron. Such a process has now been invented by Friedrich Pich, of Berlin, Germany, and patented in all the civilized countries of the globe. The method is based on the theory that cast iron might be hard soldered in an open smith's fire equally as well as wrought iron, if it were possible to free the surfaces from graphite during the process and at the same time bring the molten hard solder into intimate contact with the red hot cast iron graphite-free or decarbonized surfaces under exclusion of atmospheric air. Following out this idea, the cast iron surfaces are cleaned by means of an acid in the usual way, fixed together, and the soldering places covered or surrounded with a paste consisting of sub-oxide of copper and borax. While hard-soldering the cast iron, the borax melts and protects the cleaned surface of the iron against oxidation, and removes any oxid thereon. The sub-oxide of copper combines with the graphite contained in the cast iron surface to form carbon monoxide or oxide, thus decarbonizing the surfaces, while the metallic copper becomes disassociated in a very finely divided condition. At the same time, the hard solder is added, and as it melts it alloys itself with the incandescent particles of copper, and this new alloy immediately combines with the red-hot decarbonized soldering surfaces of the cast iron.

**HARDENED STEEL:**—A new method of hardening steel is reported from Germany. According to this method, the steel is coated with varnish and purified chalk, clay, oxide of zinc, or other refractory substance. Cyanide of potassium is then strewn on the coating and the whole is heated. The cyanide passes through the varnish and is distributed uniformly over the steel. More cyanide, preferably mixed with equal quantities of coarse salt, may be added after the steel is heated. Last, the steel is removed from the fire and quenched. A very hard uniform structure is said to be thus obtained which is not changed when the steel is cooled, and which is especially valuable in machine parts and the like.

**NEW COPPER TREATMENT:**—A new process of rolling copper is reported by which it is said results are obtained

almost equal to that of tempering. The process consists of rolling a hot steel plate and two heated copper plates together in such a way that the copper forms a skin over the steel and gives it the weather resistance that pure copper has, preventing rust, and yet leaving the strength and elasticity of the steel unimpaired. The product can be stamped, crimped and otherwise worked in ways that would be impracticable with pure copper.

**WELDING COPPER:**—Some tests in welding copper have been recently made in the laboratories of the University of Tennessee which are said to have been very successful. The copper was first treated by a secret method known as the Liebe process. Copper so treated, it is said, can be welded to itself or to iron and steel, similarly and as simply as iron is welded to iron in the ordinary blacksmith's forge. No electricity or brazing is employed, the welding being effected simply by means of flux and heat. Some of the specimens produced in the experiments stood very high tensile tests. One sample, for example, broke in two places, not at the weld, approximately under loads of 33,000 and 35,000 lbs. per square inch respectively, before it finally broke at one end of the weld at about 38,000 lbs. per square inch.

**ROLLED RAILWAY AXLES:**—Manufacturers of railway axles have for a long time been trying to discover some new method of production which is better and cheaper than the present one. Forged axles, it was found, required very expensive metal and were liable to be ruined by crystallization, so experiment was directed to rolled ones. So far perfect results have not been produced by this method but it is believed that they soon will be. One objectionable feature in rolling axles is due to the inability to arrest the longitudinal extension of the metal, which prevents the acquisition of a homogeneous density. To overcome this difficulty, collars similar in design to those employed in rolling flat bars are formed on the ends of the roll, the object being to arrest the extension of the metal in the hope of increasing the fibrous density. So far this has failed, but it is thought, that success will finally be attained by a method similar in form to the three high rolling trains, except that the rolls have a different position in the housings, and that the metal is treated in the early and last stages in an entirely different manner.

## PATENTS

"HOW TO OBTAIN PATENT, TRADE-MARK AND COPYRIGHT PROTECTION" in the safest and cheapest way is the subject of a copyrighted treatise of mine—I will mail it upon application to anyone likely to be interested.

It contains a most valuable paragraph pertaining to the protection of patent and trademark rights in the new colonial possessions of the United States. Write for it. Advice free. Correspondence solicited, and promptly and carefully answered.

**E. G. SIGGERS, Patent Attorney,**  
(20 Years Personal Experience.)

918 F St., N. W. WASHINGTON, D. C.

## PATENTS



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Patent No. 648,379. Bread-raising and clothes-drying device. Possesses practical utility. Such a device has been needed for ages. Address Annie Bennett, Brewer, Me.

**FOR SALE.**—Patent No. 645,262. Great improvement in hat and cap racks for stores. They make an artistic display, and yet take up no table, counter or floor space. Wonderful profits. Address Edward J. Kirk, Bracebridge, Ontario, Canada.

**PATENT No. 647,960.** Animal Trap. The inventor has been a trapper for years, and claims that by the use of his trap a sure catch of the animal is made, whenever the bait is disturbed. The patent is for sale either in whole or part, and the inventor invites correspondence with manufacturers to make the goods on royalty. Address G. L. Duttonhaver, New Athens, Ill.



**FOR SALE.**—Patent No. 602,073. Trousers Supporter. Worn on the inside of the pants around the hips, hid from view, easy and comfortable to wear, does away with suspenders. Address Dr. A. S. Grimm, St. Mary's, W. Va.

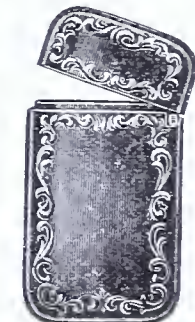
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**MONEY** to help secure patents. Southern Employment Agency, Albertville, Ala.

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Navy Yard, New York, June 23, 1899.—This certifies that the W. F. Doll Manufacturing Co. purchased from the Government at public sale on the 9th of June, 1899, four (4) breech-loading 30 pr. rifles, Nos. 17, 41, 121 and 126, weighing 13,600 pounds. (Signed) W. C. Gibson, Com. U. S. Navy.

The W. F. Doll Mfg. Co., of 9, 11 and 13 Maiden Lane, New York, grasped the occasion of the sale of these guns at the Navy Yard and bought them, all four. From this historic gun metal they manufacture watch cases, chains, charms, pencil cases, match safes, campaign badges, bracelets, lucky coins, etc., etc. —New York Daily Tribune Editorial, December 18, 1899.

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# *Inventive Age*

## AND PATENT INDEX.

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WASHINGTON, JULY, 1900.

### Farmers As Inventors.

A good deal of inventive genius which, if properly applied, should make some farmers rich, seems to be going to waste in the middle west. Nobody appreciates an improved machine more than the producers of our crops, and it is a noteworthy fact that the improvements come generally from the farmers themselves. The general impression is that we have an inventive class who go around studying the needs of the farmers and prepare to supply them. This is all wrong. The farmer is his own inventor. The manufacturers get their ideas from the farmers. One of the latest machines is purchased and placed in a field by a farmer. As he operates it imperfections become apparent, and further avenues of improvements are noticed. The farmer then sets about inventing, and the result is that he tells the manufacturer what should be done to perfect the machine. That this is a rule with farmers is evidenced by the fact that improvements are suggested by several at practically the same time. The benefit of these suggestions is generally reaped by the manufacturer, whereas, if the farmer would take out a patent on his invention first, and consult the manufacturer afterwards, he might make himself independently comfortable for life.

### Copyrights For Designs.

After years of contention by jewelers, the Librarian of Congress and the Register of Copyrights have agreed that there is authority of law for the protection of artistic designs by means of copyright, even though these are designed for application to articles of utility and not exclusively for artistic purposes.

Heretofore original designers of such articles of utility, as, for instance, silver-ware, have been confronted with the necessity of surrendering their designs to the public, for the reason that the only available method of protecting them was by a "design patent," at a cost from \$30 to \$50, a price which was prohibitory where any

large number of designs were concerned.

The change in the ruling on this subject marks, it is believed, the beginning of a practice which will be of benefit to all manufacturers of artistic goods, for the reason that it will enable manufacturers, to secure the exclusive right to all their artistic designs for the nominal cost of from 50 cents to \$1, as against the former cost of from \$30 to \$50. This, it is thought, will put an end to the piracy and imitation which has heretofore existed, and force all manufacturers to make their own designs.

### Electro Engraving.

A new and interesting process of etching on steel by means of electro chemical process, so as to do away with the necessity of engraving, is said to have been invented at Munich, Germany. The principle of the new invention was discovered more than two years ago by Josef Rieder but has only just been perfected. The etching is done by means of a porous gypsum model, dipped in a special solution capable of conducting an electric current. It was found, however, that the current became ineffective almost instantly (in fifteen seconds), on account of the etching ingredients, the carbon refuse from the eaten steel especially preventing the transmission of the electric current, thus necessitating the cleaning of the model.

The cleaning could not be done by hand, and a machine was invented which made it possible to remove the model from the plate and replace it in exactly the same position. The model is brought in contact with the plate and allowed to remain there about fifteen seconds; then it is raised and carefully cleaned with a sponge brush, and again applied to the plate.

This new machine works well, and is said to be so simple that it is thought that before long it will come into general use and enable lithographic and cardboard factories, manufacturers of stamped leather goods, and so on, to make their own dies easily and quickly.

### Mercerization.

"Mercerization," which is now so largely engaging the attention of inventors working on improvements in the treatment of textiles, is a process whose basic principle was first discovered some fifty years ago by John Mercer, of Manchester, England, and which has been so improved as to now produce both the unequal shrinkage so conspicuous in crepons and the brilliant lustre characteristic of sateens. Mr. Mercer, who was a manufacturer of cotton goods, discovered that cotton fibers treated with caustic hydrate shrank materially in length. He also found that cotton so treated became much stronger, and was more amenable to dyes without the use of a mordant. He treated a few very fine cotton handkerchiefs, making them daintier in texture than any previously known, and after exhibiting them in London, presented them to Queen Victoria. His discovery, however, remained unutilized until recent years, and was considered little more than a curiosity.

Then someone who was studying crepons, which are woven flat and subsequently crinkled by unequal shrink-

ing of the threads of the warp, had his attention drawn to Mercer's discovery, and it was found that cloths, the main foundation of which is cotton, the design being worked in mohair, when subjected to his shrinking process, were quite as effective and handsome as the former mixtures of wool and mohair. This discovery has been widely applied in the production of crepon goods, with excellent results, although it is said that they do not stand the test of time.

Other people, in the meantime, were experimenting with the object of utilizing the other part of Mercer's discovery, which was that cotton treated by this method would take dye more readily. As the shrinking incidental to the process was a disadvantage, they kept the cloth stretched, and as the expense of caustic hydrate was considerable, an effort was made to recover part of it by washing it out of the cloth while on the frame. In this way, the experimenter made quite a new discovery—that the cotton had taken on a brilliant lustre. This led to the working out of another mercerizing process, which is now extensively applied to sateens, linings, etc. The use of these goods has become so widespread as to largely displace that of silks for dress linings.

### Patent Commissioner's Report

The annual report of the commissioner of patents, Hon. Charles H. Duell, has been submitted to the Secretary of the Interior. During the past fiscal year there were received 39,815 applications for mechanical patents, 2,263 applications for designs, 90 applications for reissue, 1,739 caveats and 127 applications for prints. There were 26,540 patents granted, including reissues and designs, 1,600 trade marks, 682 labels and 93 prints were registered. The number of patents that expired was 19,988. The total receipts of the office were \$1,358,228.35, the total expenditures were \$1,247,827.58 and the surplus of receipts over expenditures, being the amount turned into the treasury, was \$110,400.77.

The examination work of the office is in about the same relative condition that it was at the close of the fiscal year ending June 30, 1890. At that time every examiner had his new work within one month from date of filing and his amended work within fifteen days of date. At the close of the present fiscal year thirty out of the thirty-six examiners had their new work within one month from the date of filing. Of the remaining six, three overran that time but by one day. The amended work in nearly all of the divisions was being acted upon within fifteen days after filing. The number of applications awaiting action on the part of office on July 1, 1900, was between five and six hundred more than on the 1st of July, 1899, but the number of applications for patents, etc., received during the last fiscal year was 5,000 greater than during the preceding year, and the number of amendments acted upon was correspondingly greater.

This is considered an excellent showing, and reflects credit upon the examining corps when it is borne in mind that a greater number of examiners were detailed for classification work than during the preceding fiscal year.

### The Telephonograph.

The information sent by United States Consul Warner at Leipsig to State Department, that there has been patented there an invention which successfully combines the telephone and the phonograph is most interesting. Such a combination has long been sought by inventors, but heretofore without conspicuous success. The apparatus in question was invented by a Dane by the name of Paulsen. The person called up has only to hold the trumpet to his ear upon returning to his office, even after an absence of days, to receive the message.

Instead of a wax cylinder, Paulsen uses a flexible steel band in his phonograph, which is said to be simpler in construction than the Edison phonograph. Messages, it is alleged, are much more easily removed from the steel band than from the wax cylinder, it being necessary only to pass a magnet over their surface to obliterate them. The band is wound on two spools, moving quickly from one to the other, and coming in contact with a very small electro-magnet, switched into the circuit, which affects the steel band in such a way as to record on it any sounds that may penetrate to the phonograph. It is only necessary to cause the steel band to repass the magnet in order to have the sounds repeated. Each vibration of the electro-magnet produces a corresponding vibration of the steel band.

### Room in the Patent Office.

When the Indian and Land offices were moved out of the Interior Department building into separate quarters across the street, it was supposed that the rooms vacated by them would be turned over to the Patent Office, by which they were sadly needed. This, however, has not been done, and unless a radical change is insisted upon, will probably not be done, the new rooms having been monopolized by the clerks in the Secretary's immediate office, each of whom has managed to secure practically an entire room to himself. These rooms are of the same size as those illustrated in recent issues of the Inventive Age in connection with the different Divisions of the Patent Office, and each of them is large enough to easily accommodate four or five men. In the Patent Office, as will be seen by reference to the files of this paper, similar rooms seat normally eight or ten persons, and it seems very unfair to allow them to be monopolized each by a single clerk, who, while connected with the executive administration of the Interior Department and therefore nominally higher, does not receive anything like the salary nor discharge anything like the responsible work carried on by the principal examiners of the Patent Office, who are so cramped for space.

### MAGNETIC GOLD SEPARATOR.

There seems to be no limit to the money possibilities of the magnetic gold and iron separator invented by Professor Elmer Gates, of Chevy Chase, Maryland, for saving the powdery gold and iron contained in the acres of hitherto worthless magnetic sand found in the United States. Professor Gates' machine, which is fully described in another column, should make him a millionaire in short order if it does all that is claimed for it.



## RECENTLY PATENTED MECHANICAL INVENTIONS AND DESIGNS

Procured through the Patent  
Soliciting Department of E. G. SIGGERS.  
Washington, D. C.

Joseph E. Cross, Brattleboro, Vt. Distilling Apparatus.—This is a simple apparatus comprising a novel boiler and condenser by means of which any liquid can be conveniently and economically distilled with great rapidity. The construction of the boiler is such that vapor is rapidly formed and carried to the condenser which by its peculiar construction condenses the same as it is supplied thereto.

William T. Hatten, Canyon City, Oregon. Wrench.—A clutch loop is pivoted on the movable jaw and engages the main shank to lock the movable jaw at any desired adjustment. The loop is held in its engaged position by a spring, and to slide the jaw it is only necessary to depress the loop against the action of the spring. The device is simple, convenient and possesses great strength and durability.

James Kelso, Murray, Alabama. Safety Catch for Cars.—The present invention is intended for inclined mine railways or cable roads having steep slopes or grades. It provides an automatic catch which operates to chock or block one or more of the wheels of a car in case of the breakage of the cable or coupling, without giving the ear time to gain any headway. The device does not interfere with the ordinary travel of the cars, and is a very useful invention that will prevent much loss of life and injury to property.

Ulysses G. Lawrence, Glenlock, Kans. Washing Machine.—A rotary cylinder is suitably mounted in a frame and is provided on the inside with ribs. A central groove is arranged in the periphery of the shell. The clothes are placed in the cylinder, and when rotated, the ribs quickly rub the dirt out of the clothes without injuring the same. The groove allows a backward flow of water, thus materially assisting in the cleansing action. The device is very simple and efficient.

Crawford D. Logan, Coal Hill, Ark. Trunk Lock.—This lock is a permutation or combination lock, thus doing away with the necessity of a key. It comprises broadly, a hasp having the locking mechanism attached thereto, the knobs being protected and concealed from view by a hinged cap plate which may be positively fastened over the operating knob. The invention is a decided novelty and has many advantages over the ordinary lock.

Josiah S. Shaffer, North Platte Nebr. Wire Hame Fastener.—The construction does away with all pivots, which are liable to become loosened and detached. The several parts are so related that they are permanently and inseparably attached to each other during the process of manufacture, and thus it is impossible for any of the parts being lost, advantages that will be highly appreciated.

Robert E. Hardaway, Carrollton, Ga. Submerged Current Motor.—The present invention comprises a water wheel adapted to be arranged in a stream of water below the surface thereof. It comprises a durable and efficient construction whereby it will resist all strain applied in operation. A further improvement is the simple means of mounting and housing the motor whereby it may be easily controlled.

Alfred S. Slyker, Wilkes Barre, Pa. Car Brake.—This invention relates to track brakes and comprises new and efficient mechanism which press the brake shoes into contact with the rails producing a reliable and effective brake that will cause a quick stoppage of the car or vehicle to which the mechanism is applied.

Ellis J. Stanley, Lanark, Ill. Switch Operating Device.—The present invention provides a switch-operating mechanism of a simple and durable character which may be mounted upon any ordinary car, and which is under the ready control of the motor-man, so that by throwing the mechanism into operation, the switch rails are operated and thrown laterally in either direction, according to whether the car is to continue on the main track, or to be directed on to the siding or switch. When the devices which shift the switch rails are not in use, they are automatically elevated above the rails where they are out of the way.

Charles H. Turner, Westphalia, Kansas. Cattle Stanchion.—Both of the upright stanchion bars are pivoted. In a series of stanchions, those arranged on one side are connected by an operating bar, whereby the whole row may be unlocked at one time. The opposite series of bars are arranged to lock independently of the others whereby any one may be operated. This is a great improvement, as it allows all the cattle to be fastened or released at one time, or any one separately.

Ephraim Manes, Chattanooga, Tenn.—Harness Buckle. This invention relates to hame tug buckles, and provides a novel construction whereby a simple connection is made between the hames and the ends of the tugs, or traces. One of the features of this buckle is the construction of the tongue, one end of which hooks into the hame eye and is securely locked in place against lateral displacement.

Wilson W. Miller, Saxman, Kansas. Grain Drill.—Heretofore grain has been sown in fields where corn has been raised, but the difficulty has been that the grain could not be sown in the corn rows, therefore much space has been lost. This difficulty has been obviated by this inventor, this being his second patent in this line. This machine has means for sowing grain in the spaces between the corn rows, and additional means for sowing the grain broadcast over the rows, thereby depositing the grain over the entire field.

Helum J. Washburn and Clinton J. Cudaback, Ransomville, N. Y. Harrow.—In this invention great improvements are made, particularly in the line of adjustable spring tooth harrows, although the improved construction may be used with equal advantage in other forms. It provides new and improved means for adjusting or setting the teeth of a harrow, and furthermore provides an improved colter shoe or runner in connection with a tubular frame.

Stephen A. Cunningham, Marietta, Ohio. Thermometer Case.—A suitable box is provided with a series of yielding cushions which are adapted to securely hold a thermometer and keep it from contact with the walls of the box. The device will be found especially useful by doctors who carry thermometers in their professional visits, as it encases the instrument in a simple and effective manner, protecting it against damage, while permitting its ready removal when desired for use.

George T. Simpson, Baker City, Ore. Ironing Board.—The invention improves the construction of ironing boards and provides an efficient and inexpensive device by means of which shirts and like articles of clothing may be easily ironed by an inexperienced person. It provides means for holding a shirt in proper shape and also for holding the neck of the same in proper position. These are advantages that will be highly appreciated.

DeWitt P. Gaymon, Pueblo, Colo. Twine Holder.—This device comprises a hanging cage which receives the ball of twine and its particular advantage lies in the novel means for facilitating the placing of the ball and for threading the free end of the cord to the exit opening whereby much vexatious delay is overcome.

John Law, Mankato, Minn. Hay Carrier.—This is an improvement on several other patents granted to the same inventor, the present invention greatly improving the construction of the sling whereby the discharge of its load is facilitated, and the spreading of the load in the hay loft may be accomplished without effort by the operator. The device is simple and reliable and is a great improvement in this line of invention.

Harrison McDowell, Reno, Pa. Rod Clamp.—The present invention improves the construction of rod couplings by doing away with screw threaded parts which become impaired by use. The construction is very simple, and is of such a nature that the more strain that is put upon the rod sections, the more tightly will they be clamped together, and yet they may be easily and quickly disengaged when it is so desired.

John W. Payne, Alexandria Bay, N. Y. Bicycle.—In this invention, a rod or bar of wood is bent into the required form of any shaped bicycle frame, and the extremities of the blank are secured to the branches of a plate forming the bearing for the axle of the rear wheel. This rod or bar is split and spaced at the proper points to afford clearance for the drive wheel, the seat post and the steering head, and is strengthened and reinforced at such points by suitable couplings of novel construction. This constitutes a cheap construction of frame that is light and durable, enabling the successful use of wood which has heretofore been to a certain extent impracticable.

Marquis T. Pew, Parkers Landing, Pa. Oil Well Pump.—A novel construction of piston is provided whereby sand and other hard materials carried by the liquid into the tube are received in suitable pockets carried by the piston, and thus prevented from accumulating near the piston head and cutting the packing. Furthermore, the parts are so arranged that the piston head is thoroughly lubricated or packed by means of fluid from which the sand has been removed. These advantages make this invention a great and much needed improvement in the art.

David E. White, Winchester, Kans. Furrow Opening Machine.—A number of pairs of disks are carried on a wheeled frame and so arranged that they will open parallel furrows in any kind of ground and without hindrance or obstruction from refuse or trash. At the same time these disks may be thrown out of operation to permit the machine to be moved from place to place. The invention is intended to be used ahead of a planter whereby corn may be planted at a good depth and thereby protected from drought and be more firmly bedded. It is a machine that will be highly appreciated.

John Rogowski, Little Rock, Ark. Wave-Power Water Moving Apparatus. (Reissue).—This is a novel apparatus by means of which a supply of water may be furnished through, the action of waves upon the sea coast. A funnel receives the waves, concentrates them and thereby they are forced through suitable passages into a delivery pipe. The peculiar mechanism and arrangement assists this movement and suitable valves prevent the back flow of the water.

Michael F. Broderick, Oberlin, Kan. Harness Attachment.—This invention provides for the lengthening and shortening of the traces or tugs in a simple and convenient way, and provides against the wear between the trace connections and the hame-bolts. A buckle of novel construction is arranged to lengthen and shorten the trace, and a wear strap is arranged between the fold of the trace and the hame-bolt which prevents all wear upon the leather. The invention is inexpensive and will undoubtedly find great favor.

William D. Hobson, Sunny Side, Va. Process of Treating Tobacco.—The process consists substantially in exposing the dried tobacco leaf to the combined and simultaneous action of smoke and steam, whereby the tobacco is aged and a flavor is imparted to the same which greatly improves the quality and makes it much sought after.

Samuel A. Shelton, Marshfield, Mo. Book and Music Holder.—A spring-pressed arm is pivoted to a base plate which is arranged to be secured to a piano or organ. This arm carries an adjustable cross bar that lays across the leaves of a music book and thereby securely holds them in a flat open position. A pawl and ratchet is arranged to hold the arm out of operative position, and the whole device is simple, inexpensive and very efficient.

Walter W. Small, Bar Harbor, Me. Chain Power.—While this invention is particularly designed for bicycles and similar vehicles, it may be used with equal advantage in a great many other ways. It comprises a novel arrangement of pulleys, clutches and connecting chains by means of which a reciprocatory motion, as for example reciprocatory pedals or stirrups on a bicycle will transmit a rotary movement to the driving wheel of the machine. Another great advantage in this invention lies in the fact that the elements are so arranged that the rotary member is allowed to continue the motion imparted thereto, when the reciprocatory members are at rest.

Walter W. Small, Bar Harbor, Me. Reversing Gear.—This invention is in the nature of a modification of the construction and arrangement set forth in the preceding patent. The construction is particularly adapted to large machines and motors and comprises means whereby one clutch dog when shifted will automatically shift the other dog, an arrangement that is unnecessary in small devices. The reversing mechanism is also of a different construction, making the idea entirely practical for a large machine.

James H. Klipstein, Marshall, Va. Stove.—The subject matter of the invention is a stove of the wood burning variety constructed chiefly of sheet metal, and it comprises a hot-air drum, between the fire box and the outer shell of the stove, said drum being surrounded by a space through which the products of combustion pass on their way to the smoke pipe. By this means the heat is entirely separated from the gases by radiation and convection and the full benefit of the fire is obtained.



**A** CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE, which keeps inventors and manufacturers posted in the art in which they are mostly interested.—The full address of any patentee, and number of patent found below sent to any address on receipt of one 2-cent stamp.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings upon receipt of 10 cents per copy; twenty copies for \$1.50.—Address THE INVENTIVE AGE Publishing Co., 918, F St. N. W. WASHINGTON, D. C.

## LIST OF PATENTS

GRANTED FOR INVENTIONS,  
ISSUED JUNE 5, 1900.

Agricultural implement.....2, pats S. L. Allen  
Air container. Liquid.....J. S. Wrightnour  
Air or oxygen. Apparatus for conveying and  
utilizing liquid.....S. H. Emmens  
Album. Photograph.....G. H. Kent  
Alloy. Antifriction.....W. N. Rumely  
Automobile.....L. S. Buffington  
Automobile balance gearing.....H. E. Heath  
Automobile delivery wagon.....H. W. Libbey  
Automobile steering device 2 pats H. E. Heath  
Axle and box. Vehicle.....J. G. Anderson  
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Badge.....G. B. Adams  
Bag fastener.....A. Arneemann  
Bale tie.....J. D. Brown et al  
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Bailing press.....E. C. Sooy  
Ball retainer and its production E. F. Creager  
Bandage. Suspensory.....A. C. Moss  
Batteries. Producing positive plates for.....  
H. Strecker  
Bed. Couch.....J. Stienen  
Bed or douche pan.....D. Hogan  
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Bicycle seat post.....A. W. Nutz  
Bicycle seat support.....P. Smith  
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Jack..... C. W. Doane  
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Miter cutting machine..... J. W. Oliver  
Molding box or flask..... O. S. Michaelsen  
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Paper barrel..... J. Van Develde  
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Photographic vignetter..... C. W. Chrizman  
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Planter. Corn..... W. Bowers  
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Plastering apparatus..... J. R. Tobin  
Plate holder. Magazine..... H. J. Erkenwick  
Plowshare..... C. C. Coffinberry  
Plowshare. Reversible..... J. R. Trull  
Pocket holder..... E. J. Haeverly  
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Press board..... F. O. Rundquist  
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Projectiles. Securing caps to..... O. Hartman  
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Railway rail..... H. W. Libby  
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Sawmill carriage attachment..... J. A. Waterman  
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Scale. Recording car..... G. Goetz  
Scissors. Buttonhole..... L. Chybrynski  
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 Railway switch. Aerial.....O. Joedicke  
 Ratchet wheels. Controlling.....W. N. Parkes  
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 Refrigerator box.....C. J. Stuart  
 Revolver.....C. D. McDonald  
 Rheostat. Motor.....J. L. Hall  
 Roasting apparatus. Meat.....C. W. Bradlee  
 Roll for reducing tires.....F. P. Maus  
 Rotary engine.....C. Beach  
 Rotary engine.....J. Knowles  
 Rotary engine.....G. W. Seward et al  
 Rubber boot trees. Heel trimming machine for.....W. H. Austin  
 Rubber. Preparing coatings of.....J. Minder  
 Sad-iron handle.....R. A. Hawkins et al  
 Saddle. Pack.....E. F. Bliss  
 Sand drier.....E. L. Merriam et al  
 Sash and frame.....W. J. Jene  
 Saucer. Drinking vessel.....B. Hoffman  
 Sawmill carriage device.....T. C. Bondurant et al  
 Sawmill set works.....F. W. Shuls  
 Scoop.....E. E. Davenport  
 Scythe blade brace.....C. A. Ellis  
 Sealing envelopes. Apparatus for.....G. N. French  
 Secondary battery.....C. J. Coleman  
 Sewing machine.....W. N. Parkes  
 Sewing machine. Button.....J. J. Sullivan  
 Sewing machine attachment.....H. H. Tenholm  
 Shade adjuster. Window.....D. F. McCarty  
 Shears and knife. Combined.....F. F. Fulk  
 Sheet metal articles. Forming.....P. Lindemeyer  
 Shoe fastening.....A. A. Soderberg  
 Shoe nails.....H. A. Weeks  
 Shutter.....H. A. Hickok  
 Shutter worker.....A. Ritter  
 Shuttle binder.....F. Babcock  
 Signature gatherer.....D. M. Smyth  
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 Sponges. Making artificial.....T. A. O'Callaghan  
 Stacker. Pneumatic.....J. B. Bartholomew  
 Stacker. Pneumatic straw.....H. L. Hegland  
 Stamps. Caster rack for.....H. S. Folger  
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 Steam trap.....C. W. Lyon  
 Still.....W. R. Benjamin  
 Store service.....E. W. Hays et al  
 Store serving apparatus.....H. D. B. Williams et al  
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 Stove.....I. Brooke  
 Stove.....W. R. Hampton  
 Stove. Sheet iron.....reissue.....J. A. Schneide  
 Street sprinkler.....R. L. McDade  
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 Sulfur from ores. Extracting.....J. S. Fleming et al  
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 Window.....W. D. Watson  
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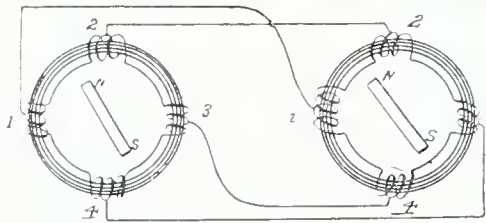
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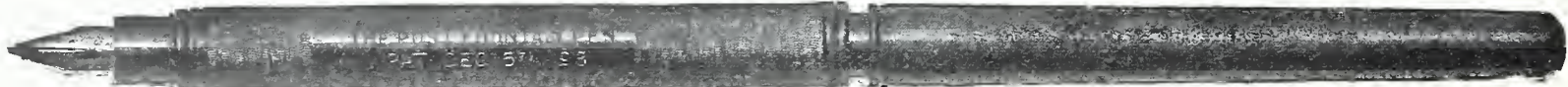
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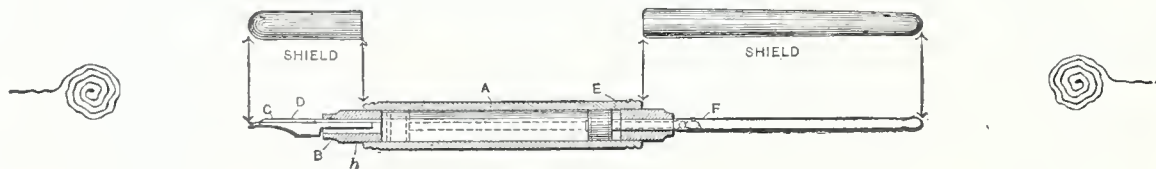
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## THE PARIS EXPOSITION.

### Foreign Buildings Along the Banks of the Seine.

While Presenting no Combination of Grandeur like that of the Court of Honor at the World's Fair at Chicago, the Appearance of the Buildings is Nevertheless Most Striking.

All expositions necessarily have their main features in common. Each new one strives to present some startling novelty, such as Eiffel Tower at Paris in 1889, the Ferris Wheel at Chicago in 1893 and, in default of something better, both of these at the present exposition; while the machinery hall, the transportation section, the palace of fine arts, the divisions allotted to various industries, appear in all. It seems to be generally conceded that the Exposition of 1900 offers no such architectural effect as was afforded by the Court of Honor, in Chicago, and bird's eye views of the grounds simply show a number of huge buildings, meaningless to those who have not seen them. The illustration selected by the artist for the readers of THE INVENTIVE AGE gives an idea of the buildings erected by the principal foreign governments within the Exposition grounds. There are over 50 foreign buildings in all, ranging in types of architecture from Greek to Gothic, from Roman to Renaissance, from the balconied pavilions of the Orient to African kraals. Many of these, of course, represent the various colonies of European powers.

The chief buildings, as shown in the illustration, are on the banks of the Seine. The one to the extreme left is that of Italy, which is nearest to the principal entrance over the new

bridge in honor of the Czar, and is the largest building in this section of the grounds. It is a beautiful specimen of architecture, within and without. The Turkish building is the one next to it, and the third is that of the United States, a rather unfortunate juxtaposition of three domes.

The United States building, as is well known, is a copy of the tomb of General Grant in Riverside Park, New York. The French press calls it "an imitation, but not a servile copy of the classic type of Greek art" and refers to the

"lofty hall, bold staircases, number of elevators, and wealth of light within." The front is ornamented by an equestrian statue of Washington, and a group showing the Goddess of Liberty conducting the chariot of Progress. The eagle surmounting the dome can be just distinguished in the illustration.

The next building to the right, as one looks at the picture, is that of Austria; then comes that of Bosnia-Herzegovina. The tall tower adjoining marks the Hungarian building, an attempt to reproduce all styles of construction in the Magyar State, from the ancient Roman to the present. The result is rather more happy than one would expect of such a combination. The next is that of Great Britain, which suffers in the illustration in comparison with the others, as it has no prominent

features. It is in reality one of the most beautiful buildings at the Exposition, being a copy of Kingston House, a perfect specimen of the architecture of the seventeenth century, and holds a priceless collection of pictures, jewelry, furniture, and similar articles. Belgium follows, with a reproduction of the City Hall at Audenarde, built in 1525, the effect of which, with its towers and gables, is most picturesque. Norway, which wished to have a building separate from that of Sweden, comes next, and the contrast of its design with the houses adjoining is striking and happy.

The German building, following on the right, is reminiscent of mediaeval architecture, and the outlines are restful to the eye, accustomed to conventional modern types. The next structure is that of Spain, presenting a construction in which the Hispano-

Moorish traditions are adapted to the state of the nineteenth century. "Spain wished to show," says a French writer, "that in spite of the loss of her colonies, she has yet sufficient vital force in the resources of her own soil, and the building is second to none at the fair." Its details are taken from castles and palaces of historical association—the University of Alcala, which was built in 1553; the Alcazar of Toledo, constructed under Charles the Fifth; and the University of Salamanca.

The tall tower following is that of Monaco; Sweden has an airy construction adjoining; and the next, belonging to Greece, shows the Byzantine style of architecture. The ensemble forms, perhaps, the most picturesque and effective group of build-



FOREIGN BUILDINGS AT PARIS EXPOSITION.



ings in the exposition.

Expositions, no matter how interesting, are costly playthings. The Paris Exposition attendance thus far has not exceeded an average of 150,000 a day. It has been estimated that to make it a financial success would require a total attendance of 60,090,000 paid visitors, or an average of over 300,000 a day, nearly double the attendance at the exposition of 1889, when the admissions numbered 32,354-111. The showing thus far indicates a large deficit at the close, and the closing of 32 enterprises of the Midway kind already is a straw showing which way the winds blows. Undoubtedly, this is largely due to the wars which have distracted public attention.

Contracts for the dismantling and razing of the Exposition buildings have been signed, the job being given to the Chicago firm which tore down the buildings after the Columbian Exposition and also those at the Omaha Exposition. The contract for the work was signed the day the Exposition opened. Lumber is very dear in France, and there will be 75,000,000 feet available after the close of the Exposition.

## PROGRESS OF INVENTION.

### Food Inventions.

**WOOD FLOUR:**—From Germany comes a surprising though well authenticated account of an invention whereby flour can be made from wood and baked into a wholesome and palatable bread. Professor Antenrieth and his family proved the value of the invention by subsisting entirely on it for some time. To make the flour, the wood is stripped of bark and sawed into thin disks, which are beaten to pieces in a pounding mill, and then mixed with the sawdust and soaked in water until all the soluble constituents are removed. It is then dried and repeatedly ground in a mill. Next it is made into cakes, with water made slightly mucilaginous by the addition of linseed, mallow stocks, lime tree bark or some other substance; then baked; then broken up and ground and baked again; repeating

the process until the flour is fine enough to pass through a bolting cloth. Antenrieth found that 15 pounds of this wood flour, three pounds of sour wheat leaven and two pounds of wheat flour mixed with milk, made 36 pounds of good bread.

**PASTEURIZED MILK:**—Cheese of pasteurized milk has until lately been considered almost impossible to produce, and dairymen have been at a loss how to use the churn milk, which has been sold as feed for pigs or thrown away. A short time ago, however, a chemist at Stockholm—Dr. Frank Elander—succeeded in effecting a preparation that solved the above mentioned difficulties. Owing to his discovery, which has been named "caseol," palatable and nourishing cheese, free from tubercular bacilli, can now be made from pasteurized skim milk. This preparation has, moreover, the excellent quality of rendering cheese more digestible. Several dairies in London have made experiments with caseol, with the same favorable result.

**PEANUT OIL:**—The peanut oil industry has grown to such large proportions that an efficient cleaning machine is badly needed, those at present in use not being altogether successful in removing the inner red skin. The husking of the peanuts is performed by a pair of grooved rollers, adjustable in order that the space between them may be increased or diminished according to the approximate average size of the nuts to be husked. The rotation of these rollers is quite rapid, the ridges of one of the rollers fitting into the center of the grooves of the other roller. In this first process the husks are completely crushed, and a good many of the kernels are also split. This broken mass of husks and kernels is then separated by means of a winnowing process. If the peanuts used are of old crop, the kernel is likely to be dry, and the light, inner red skin of the nut becomes easily detached. But if they are new, it is most difficult to remove the red skin entirely, and the kernels generally go under the presses with the greater part of the red skin still adhering to them. This lessens the value of the oil cake.

**BUTTER PACKING.**—Attention has been attracted in Germany to a new method of packing butter which has been tried with satisfactory results in connection with shipments from Melbourne to Kimberly. It consists in placing the butter in a box formed of six plates of ordinary window glass, whose edges are closed with gummed paper; the glass box is covered with a layer of plaster of paris one-fifth of an inch thick, and wrapped in waterproof packing paper. As the plaster is a bad conductor of heat, a regular temperature is maintained within the box.

### India Rubber.

One of the most profitable fields for experimental investigation undoubtedly lies in attempts to find some substitute for rubber and gutta-percha, the world's supply of which is running alarmingly low. The scientific journals of the world are continually publishing accounts of new processes, whereby the india rubber tree can be more efficiently worked and the precious substance extracted from its leaves, roots and bark, as well as by tapping the trunk; also details of entirely artificial substances, which are designed to take the place of the genuine article. None of these, however, as yet seem altogether satisfactory and the field is still open.

**VEVRIL.**—Vice Consul Murphy sends from Magdeburg a translation of an article from the Deutsche Handels Museum, which states that there has recently been exhibited to the London Society for Chemical Industry a substitute for caoutchouc and gutta-percha called "vevrii." It is said to be composed of nitrocellulose mixed with linseed oil or castor oil. This mass, which is said to resemble Para rubber, is obtained by mixing 1 part of nitrocellulose with 2 parts of oil. Castor oil yields a better product than linseed oil. The utilization of the material is effected by pressure or the influence of heat. An easy way to use vevril is to soften it with a solvent and then cause the solvent to evaporate. Vevril is said to be preferable to South American caoutchouc, in that it does not injure copper.

**RUBBER FROM LEAVES:**—A new company has been registered as the Nederlandsche Getta-perga Maatschappij, with a capital of 200,000 florins, which professes to have the secret of how to extract gutta percha from the leaves of the Isanandra tree. The firm has obtained concessions over territory on the Lingga Isle in the Riama Archipelago in Dutch India, where 2,800 acres are covered with such trees. In planting new trees one has to wait ten or fifteen years before tapping brings a small recompense, but it is said that the leaves can be turned to good account after two years. A five-year old tree gives 11 pounds of leaves annually, and a fifteen year-old 130 pounds, which quantity, it is said, is worth a dollar, and gives several pounds of gutta-percha. The same process might be applied elsewhere.

**CAOUTCHOUC FROM BARK:**—A new process for the extraction of rubber from the rubber tree consists in cutting up the bark and roots and soaking in dilute sulphuric acid. This de-

composes the woody portions without affecting the India rubber. In this way the rubber and the bark and roots are separated.

**AGRICULTURAL EXPERT OPINION:**—In discussing the decreasing supply of rubber, O. F. Cook of the Agricultural department, after reviewing the conditions existing in rubber producing countries, says:

"Whatever the ultimate conclusions from these investigations and discoveries, the great diversity of opinion among students of the subject seems to indicate that we know extremely little about the constitution of the latest or the best methods of extracting rubber, and we may still be far from the place where the invention of processes or appliances of permanent utility is to be expected. Proper manipulation may enable the extraction of rubber from juices not now utilized, so that a new process as well as a new plant might at any time revolutionize the whole subject of rubber culture."

**GUTTA-PERCHA IN THE PHILIPPINES:**—Consul Hughes, of Coburg, writes, "According to a work on the subject just published in Germany, the supply of gutta-percha is almost exhausted, owing to the reckless and primitive way in which the trees were treated in Sumatra and Borneo, whence the principal output has come. As these trees will flourish only in a very few places, the question has become serious. The book adds that the Philippines is the proper place to grow gutta-percha cheaply and profitably."

### Medical Progress.

**ANTI-ALCOHOL SERUM:**—The discovery of serums for fighting diseases multiplies. The world has long known the small-pox serum, but the diphtheria serum, the hydrophobia serum, the consumptive serum are of more recent date. There are several serums for the prevention of plague, one of which has just received a prize of \$3,000 from the French Academy of Moral and Political Science. The British press notes an anti-cancerous serum, devised by a Russian physician and now being used therapeutically in Paris, with, it is said, promising results. A recent consular report says that an anti-alcohol serum is the latest to be invented.

French doctors have found that a horse fed for a certain time on doses of alcohol, and food mixed with alcohol, furnishes a serum which, injected into victims of the alcohol habit, appears to give them a distaste for liquor. In 57 cases treated, 32 were successful, 8 were improved, and 17 were failures, due, the inventors claim, to irregularity of treatment or physical defects. The action of this serum, it is asserted, awakens reflex acts, which, as a whole, constituted originally the instinctive distaste of man for alcohol, and re-establishes a natural habit in place of induced habit.

**KILLING BACTERIA BY ELECTRICITY:**—The interest aroused in the new cure for consumption by means of electric currents, applied in a New York hospital by a French physician, is supported by a report in the German press, of the discovery that electricity is fatal to certain bacteria, and can be

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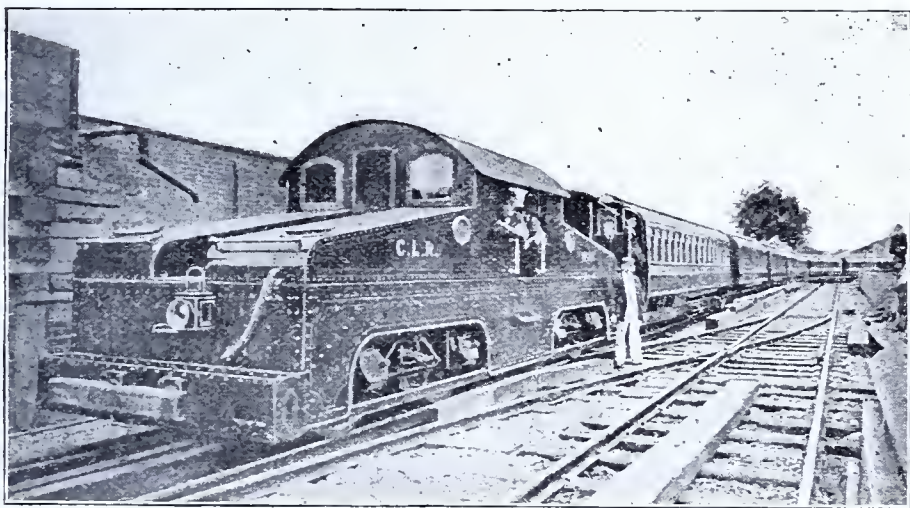
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used in the treatment of diseases caused by them. Only weak currents are employed and the method is said to be entirely painless.

**TREATING DISEASES BY LIGHT:—**Minister Swenson sends from Copenhagen, December 2, 1899, a letter in reply to inquiries as to the treatment of certain diseases by concentrated light rays. He says: "Dr. Finsen's Light Institute was founded in 1896, for the purpose of making and encouraging investigations regarding the effects of light on the living organisms, especially with the view of utilizing light rays in the field of practical medicine.

"Altogether, some three hundred and fifty cases of lupus vulgaris have been treated, in all of which satisfactory results have been obtained. A large number of cases have been treated experimentally for other diseases of the skin, among them erysipelas and alopecia areata. Scarlet fever is to be experimented with. Dr. Finsen's successful treatment of small pox by means of red light is also very interesting and ought to be widely known."



TRAIN ON LONDON UNDERGROUND ELECTRIC RAILWAY.

### Land Travel Inventions.

**UNDERGROUND ELECTRIC ROAD IN LONDON:—**The new electric underground railway in London was opened on June 27, and now, for the first time, the Londoners have, albeit on a small scale, the comforts of rapid transit which every city dweller in the United States claims as his absolute right. Until now, extensive London was dependent on one dapp, dark and dirty underground steam road and on 'busses and horse cars.

The trains will be made up of seven coaches carrying altogether 336 passengers and drawn by an electric locomotive weighing about 45 tons. These coaches, which are all American in type, are of one class only, and the fare to be charged has been fixed at 4 cents for any distance. Electric light is, of course, employed for their illumination. The locomotives are carried on two four-wheeled trucks, and there is a gearless motor of 125 horsepower on each axle. A speed of about 14 miles an hour, inclusive of stoppages, is to be maintained. A very large part of the plant is of American manufacture. English makers, indeed, are not entirely unrepresented. They have supplied an overhead crane, some feed pumps, the carriages, and some not very large engines for driving fans,

but they cut a sorry figure beside those from the other side of the Atlantic, who made the locomotives, the cables, the main generators, the exciters, and the main engines. Probably British experience of electric-traction work was too limited to enable them to carry out the contracts satisfactorily.

The average depth of the tunnels below the surface is about 70 feet; at the stations they rise somewhat nearer the surface than in the intermediate sections, and therefore an arriving train runs up hill to the station while a departing one runs down hill. In this way both starting and stopping are aided by the force of gravity, and the strain on the motors and generators at starting is reduced; at the same time the depth of the shafts for the lifts is lessened.

**OVAL STREET CARS:—**An invention by two Indiana men, designed to enable street car companies to do away with the necessity of having separate cars for winter and summer and to enable one kind to be transformed into the other, has recently been patented. The new car is oval in cross section, its ribs being arranged as runways for

the curved sections of wood or metal which form the sides of the car. The roof is of double thickness, with pockets in line with the ribs, forming extensions of the curved side. In the center of the roof are arranged a series of pulleys with cables attached to the upper edges of the sliding sections, the opposite ends of the ropes being wound on a shaft, thus enabling the conductor to open and close the car by turning a crank on the shaft. When the cables are unwound, the sides will slide downward of their own weight until connection is made with the floor, the curvature of the side allowing the passengers to sit close to the ends of the seats without interfering with the work of altering the car.

**GERMAN AND FRENCH TESTS:—**A number of experiments will soon be made by the German army with different types of automobiles for military service. The railway brigade has charge of the matter and is to try a series of trains in the open country. In France a series of grand maneuvers will take place this year in the eastern part of the country, in which a number of different types of automobiles will be tried, such as petroleum and electric vehicles and motorcycles, besides heavy Scotte traction engines for the transportation of freight and baggage.

**NEW STYLE OF MOTOR:—**A new style of motor carriage comes from Australia, in which the driving mechanism uses neither chain nor leather belts, nor continually rotating sprocket wheels. It is operated by an explosive engine, in which oil is the actuating agent, and is so constructed that it is applicable to any class of conveyance. All the parts are accurately balanced to reduce the vibration to a minimum, and the explosions, of which there is one to each revolution of each opposite pair of cranks, are absorbed by two pistons in each cylinder. The explosive mixture is electrically ignited, and by a simple system of crank levers and connecting rods, a variable speed transmission gear is obtained which is most effective in action. From it, can be communicated to the main driving axle all speeds, varying from zero to any predetermined maximum without altering the speed of the motor. The maximum power for hill climbing and rough roads, as also all changes of speed, is obtained by the movement of one lever by the driver.

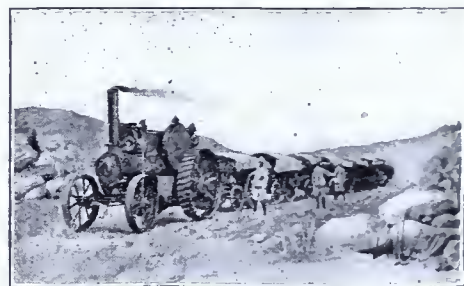
**WIND CARRIAGES:—**A Kansas City paper is responsible for an account of a wind propelled carriage invented by a man in that town named Mendenhall. The machine is described as a queer looking, four-wheeled carriage, rather rudely built, with two horizontal bars like pump handles, which propel the carriage by hand force. As soon as a start is obtained by working these levers up and down, the wind does the rest.

"I've made eighteen miles an hour with her often," said the inventor to a reporter. "I frequently come out on the boulevard for a spin. Its easy to work. A child or a lady could run it. Yes, its my own invention. I expect to make a fortune out of it, too. Not like one of these automobiles—no fuel needed; always ready." Just how the wind does it the work was not explained.

**MOTOR POST CARTS:—**An interesting experiment is to be made within a short time in the collection of mail in Detroit by automobiles. Electric vehicles failed in this service,

because actual experiment showed that the power consumed in starting after the hundreds of stops necessary, was so great that the stored electrical energy was insufficient. It was also found that if the batteries were enlarged so as to hold sufficient power for all the starts, the wagon would be too heavy to move around easily. Recharging was too slow, too costly and too inconvenient.

The Detroit wagons will be operated by a gasoline motor. The man proposing the use of these carts wishes to make a contract with the department for them all over the country. He proposes to put three in use in Detroit as an experiment. He claims that one wagon will do the work of two of the old horse carts and offers to do the work at the same price, the saving to the Government being in the time of the letter-carriers.



TRACTION TRAIN IN SOUTH AFRICA.

**MOTOR GUN CARRIAGES:—**The traction trains used in the South African war have succeeded tolerably well and attempts are now being made to devise a gun carriage that will carry heavier weapons than have heretofore been used in field work. What is wanted is a well-built traction vehicle, with strong-tired wheels, and of minimum weight. Strength is as important as the reduction of weight, and it is in this respect that the motor gun vehicles tried recently have been wanting. An important adjunct to such a gun traction vehicle would, of course, be a cable drum which could be fitted and thrown in gear for assisting to draw guns, by means of a wire rope, up such ascents as those experienced in South Africa. Many of the traction engines now made have similar drums, and they prove very useful in ordinary work.

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for building and equipping railways, water works, electric light plants; developing mines, meritorious inventions and good business enterprises.

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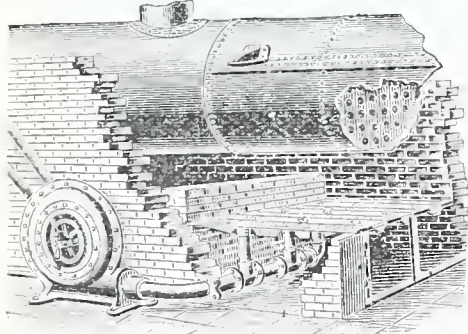


## DO YOU LACK STEAM?

The Gordon Hollow Blast Grate Will Help You. It Burns Sawdust, Bagasse and Other Refuse Combustible Products.

The high price of coal nowadays, and the probability that it will never again be as cheap as it has been in the past, has served to draw special attention to other forms of fuel, and this again has caused a demand for special furnaces capable of burning these economically and properly.

One of the very best and most ingenious of such furnaces is the Gordon Patent Hollow Blast-Grate, now entering on its eleventh year of uninterrupted success. It will generate steam to the capacity of the boiler from wet sawdust, bagasse, tan bark, coal dust and other kinds of refuse fuel, and at the same time, affords means, by increasing and decreasing the air supply, for easily regulating the fire to suit the occasion, making it burn quietly, moderately or fiercely. Withal, it reduces to a minimum the burning out of grates, and the consequent trouble and expense of replacement.



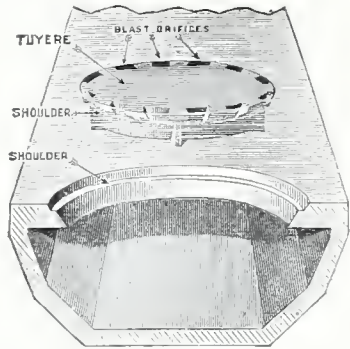
GENERAL VIEW OF GORDON GRATE

The world no longer recognizes the possibility of failure in the tuyere iron of the blacksmith's forge, when properly supplied with compressed air from the bellows. Centuries of practice have demonstrated that air is the all important point and this is furnished by the Gordon Grate, making it as certain in its results as the blacksmith's forge, while of course far larger and cheaper. When properly set and operated, the fire is quickened as though a hundred muscular arms were pumping with might and main on a like number of bellows, whose tuyeres were located underneath the fuel on the grate.

The Gordon Grate consists of three principal parts—the grate bars themselves, lying just where bars usually do; the main blast pipe, extending from just outside of the furnace wall transversely, through the furnace, at right angles to the grate bars, on the ground line, just in advance of the bridge wall; and the connecting tubes, extending vertically from the main blast pipe below to the blast grate bars above, and establishing connection between the two. The special feature of the grate lies in the construction of the tuyere grate bars.

In these, an air chamber or duct having a transverse area  $3\frac{1}{2} \times 6$  inches extends through the body of the grate bar. In the heavy top of the bar, four or five openings, each seven inches in diameter, are cast, bored and reamed to a uniform size for the reception of the heavy lid-shaped valve with which each is fitted. These valves are each provided with a series of circumferential notches, through which the air within the bar escapes, to fan the furnace fire. At the bottom

of each of the openings is a strong seat, which supports the valve; this, together with a series of lateral projections on the valve itself, serves to hold the latter securely in place, and prevents canting.



DETAIL OF GORDON GRATE BAR

Instead of being laid side by side in the furnace, the tuyere grate bars are alternated with perforated draft-grate bars, of special design, each of which is likewise eight inches wide, and of course of the same length as the tuyere grate bars themselves. These perforated bars supply the natural draft, the tuyere bars being designed as blast grate bars only.

To curtail the supply of air entering a furnace is to retard the progress of combustion within. A familiar example of this is seen when the dampers in the ash pit doors and the stack are suddenly closed. On the other hand, when it is desired to crowd a fire to the utmost, all the dampers are opened and the fire given all possible air. With natural draft alone, however, the limit is reached the moment the last damper is opened. Not so, however, with the Gordon system, the volume of whose blast is susceptible of increase to an almost indefinite degree. For all practical purposes there is no limit to the extent to which a fire may be forced by it, and, of course, the hotter the fire in the furnace, the faster is the steam generated in the boiler. It is because of this quality that the Gordon Grate makes it possible, so users say, to get from 10 to 100 per cent. more steam out of a boiler than is otherwise obtainable.

The Gordon Hollow Blast-Grate Company, of Greenville, Mich., was organized in 1889, with a capital stock of \$24,000, Rufus F. Sprague being the chief promoter. For seventeen years prior to that time Mr. Sprague had been Secretary, Treasurer and General Manager of the Greenville and Grand River Log Running Co., in which capacity he had control over hundreds of men, and handled millions of dollars. Mr. Sprague was a man of excellent judgment, wide experience, enterprise and energy. He at once saw the practical utility of the hollow blast-grate, and how best to convert it into money. The band saw mill was still comparatively new, and considerable difficulty was being experienced in disposing of the fine sawdust, usually wet, which was produced by it. Mr. Sprague was satisfied that the hollow blast-grate would promote the combustion of this refractory fuel to such an extent that it would generate steam as rapidly as dry wood in the ordinary grate.

Accordingly he wrote to the firms producing this saw dust offering them the grate for burning it in the manufacture of their motive power, and making the following sweeping guarantee: "If at any time prior to the expiration of the thirty days next suc-

ceeding the erection of the apparatus, you conclude it does not meet your requirements, or if for any reason satisfactory to yourself, you conclude it is not for your interest and advantage to retain the same, you are to at once notify us, and, removing the apparatus, hold it subject to our order." This guarantee the company still makes.

It was not long before most of the largest and best saw, hoop and stave mills and heading factories in the country were equipped with the grate, and many found their way to foreign countries. Lumbermen and cooperage stock manufacturers of national prominence unhesitatingly wrote flattering testimonials, and the Gordon Hollow Blast-Grate Company entered upon a prosperous career that has not yet ended.

At the very time when the lumberman was vainly endeavoring to burn his band sawdust, the sugar planter of the south was equally at a loss to know what to do with the refuse of the sugar cane, technically known as bagasse, which was so incombustible as hardly to be susceptible of decay. In 1891, Mr. C. S. Burt, of New Orleans, La., solved the problem. Some time before, as President of the Burton Laboring Co., Baton Rouge, he had purchased a set of Gordon Hollow Blast-Grates, and witnessed their wonderful efficiency. He now entered into a contract with the Gordon Hollow Blast-Grate Company, under which he was to have the exclusive right to manufacture and sell their grates in Alabama, Mississippi, Louisiana, Texas and Arkansas south of the Arkansas River. This contract is still in force, the present style and address of the company organized by Mr. Burt to prosecute the Hollow Blast-Grate Bagasse Burner business being the C. S. Burt Co., Limited., 726 Gravier Street, New Orleans, La. The Company has built hundreds of the now famous bagasse burners in the sugar raising districts of the Southern United States, Mexico, Cuba and Porto Rico. There is hardly a mill in their territory in whose furnace the Gordon Hollow Blast Grate may not be found.

To Mr. Sprague, who organized the Gordon Hollow Blast-Grate Company, and who has been its President and General Manager ever since, the wonderful commercial success of the Gordon Hollow Blast-Grate has



RUFUS F. SPRAGUE.

been largely due. His was the penetration that first saw its possibilities; his the practical common sense that improved and perfected it; his the enterprise and intelligence that so effectively advertised it; his the unflagging energy that surmounted all obstacles.

Personally, Mr. Sprague is one of nature's noblemen. His conversation is bright and sparkling; his wit ready; his temperament buoyant and sympathetic. He is blessed with a retentive memory, and a clear, vigorous and quick intellect. He is a great lover of flowers, music and good books, and has made some valuable contributions to the advanced economic and political literature of the day.

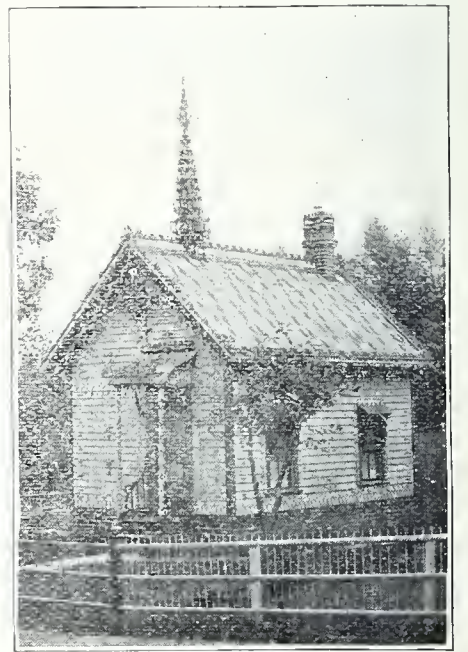
In 1896, Mr. Sprague was the nominee of the Gold Democrats of his State for Governor, a position which, it is safe to say, he would have filled ably and well, had he been elected.

Mr. Sprague is interested in other inventions, having patented a hand pot to planter of considerable merit. This patent was issued October 10, 1899 and bears number 634,483. Mr. E. G. Siggers, Patent Lawyer, of Washington, D. C., is his attorney, having personally attended to his work for many years.

### A Queer House.

Described by its Builder who Calls Himself, "King of Poets."

"Residence was finished in the spring of 1892. Picture taken November 3, 1896. Visitors come to see it every day. It is ornamented with 25,000 pieces; 14,300 porcelain head upholster tacks; 2,000 red, white, blue and yellow disks; 1,772 white porcelain shutter knobs; 850 three cornered wood points, blue with yellow edges; 350 red, white, yellow and blue rings; 210 various colored marbles, two inches through, mostly glass.



"The cupola is 12 feet high, has 50 small spires or minarets on it, with 36 double doors and windows, each one in a corner. It is a bird house with 25 different sized and colored images of birds on it, mostly of china. It has a small bell in it and a small statue of a lady in an open story.

"The chimney top has a large wind-wheel composed of six small ones, with six looking glasses on top of it. When the large one turns the little ones bob in and out looking much like humming birds. Two various colored windmills are attached to the front fence, with the bicycle sign.

"The house is ornamented with over 50 different kinds of scroll work. The round house with the eleven square roof is a cave, on top of which is a small house designed for a model residence of eight rooms. The main roof has six gables and no eaves, the look-out four gables. It was covered with seeds and trimmed in braid and exhibited at the Blue Grass Palace at Creston, Iowa. Then it had a fountain in front with small fish in it. Some of the neighbors say it is the nicest thing they ever saw.

"The body color of the house is light green, trimmings dark green. The scroll work is green, red, blue, yellow and white, all harmoniously arranged so the colors complement each other. The work, designs and finish was made by the 'King of Poets,' to show how the ideal looks in the real, while giving new designs for finishing houses, and show that a small home can be made as beautiful as a large one. It is called 'The Temple of Beauty,' the 'Nicest House in the World,' by the hundreds and thousands who come to see it. The front walk from the house is of red and gray stone, the outside walk is black and gray stone."



## ELECTRICITY.

### Its Services Recognized at Buffalo.

Progress of the Science.—Used in Medicine, Cookery, Blasting and Pretty Much Everything else.

The fact that this is the age of electricity will be fittingly recognized at the coming Pan-American Exposition at Buffalo, where there will be not only a fine electric building, but also an electric tower, nearly 350 feet high, from whose top a gigantic figure of Electricity will look down upon and dominate the fair, which owes so much to its wonderful powers.

The dignified and stately beauty of this electric tower will command the admiration of every visitor. Its top is 348 feet above the surface of the broad basin in which it stands. It is flanked on the east and west by long curved colonnades, which sweep to the southward and terminate in airy pavilions, forming a semi-circular space 200 feet across. Within this space and in a high niche in the main body of the tower are cascades, while all about the basin are leaping jets and countless playful figures, each with its spurt of water, combining to make a brilliant water scene. At the center of the niche is a tall geyser fountain, whose waters find their way from the high basin within the niche over successive ledges and among a multitude of vases to the level of the pool.

The main body of the Tower is eighty feet square and is treated with great simplicity. The centre of each side is paneled with fantastically perforated work, calculated to produce a remarkable effect when lighted from within, as it will be. The main shaft of the tower terminates in an elaborate entablature, upon which rests the crown of the tower, composed of three stories of diminishing proportions and varying design. The lower of these stories is an arched loggia; the second is in the form of a high circular colonnade, entirely open, so as to allow the sky to be seen between the columns; a spiral staircase leads to the last stage, the cupola, over whose soaring dome is posed the figure of Electricity.

**ELECTROLYSIS:**—The corrosion worked in sewer and gas pipes and the like by stray currents from electric street railways, electric light wires, etc., known as electrolysis, used to do great damage until the electric companies found that they were losing almost as heavily as the public by the waste. Since then, they have been striving to prevent it. In Great Britain, the plan has been adopted of supplying return feeders, at a heavy cost for copper, instead of simply turning the current into the earth and letting it find its own way back. In the United States, distances are too great to make this profitable and the field lies open for some inventor who can offer a suggestion that will be feasible.

The general principle of the corrosion is clear enough, but the quantitative side of the problem has so far received little attention. There is thus room for some rather novel notions, such as G. Claude has expressed before the Societe Internationale des Electriciens. He argues against the

general opinion that the iron pipes concentrate the stray currents in themselves, being better conductors than the earth in which they are buried, holding that only part of the stray currents enter the metallic pipes, and that only a part again acts electrolytically, because the chief portion of the current passes directly from the rails to pipes through earth, the earth conducting like a metal. He has made measurements to support his view. In very bad cases, where up to 30 per cent. of the total line current left the rails and returned by another path, he has found that the currents in the pipes were not a tenth or even a twentieth of that strength. Further, the weight of the corroded metal did not in any way correspond to the strength of the stray current. There is room here for further investigation.

**ELECTRIC KITCHEN.**—The latest appliance of electricity is to cooking. In Utica, N. Y., a block of new apartment houses has just been furnished with complete installation of electric cooking utensils in each flat. The most remarkable feature of these electric appliances is that the stoves, &c., are simply placed on an ordinary kitchen table, and, when the cooking is completed, can be stowed away in a convenient closet, leaving the kitchen free of even a trace of cookery. Space is thus saved, and the kitchen can be as small as the conscience of the architect will permit because of this saving, and also because the electrical uten-

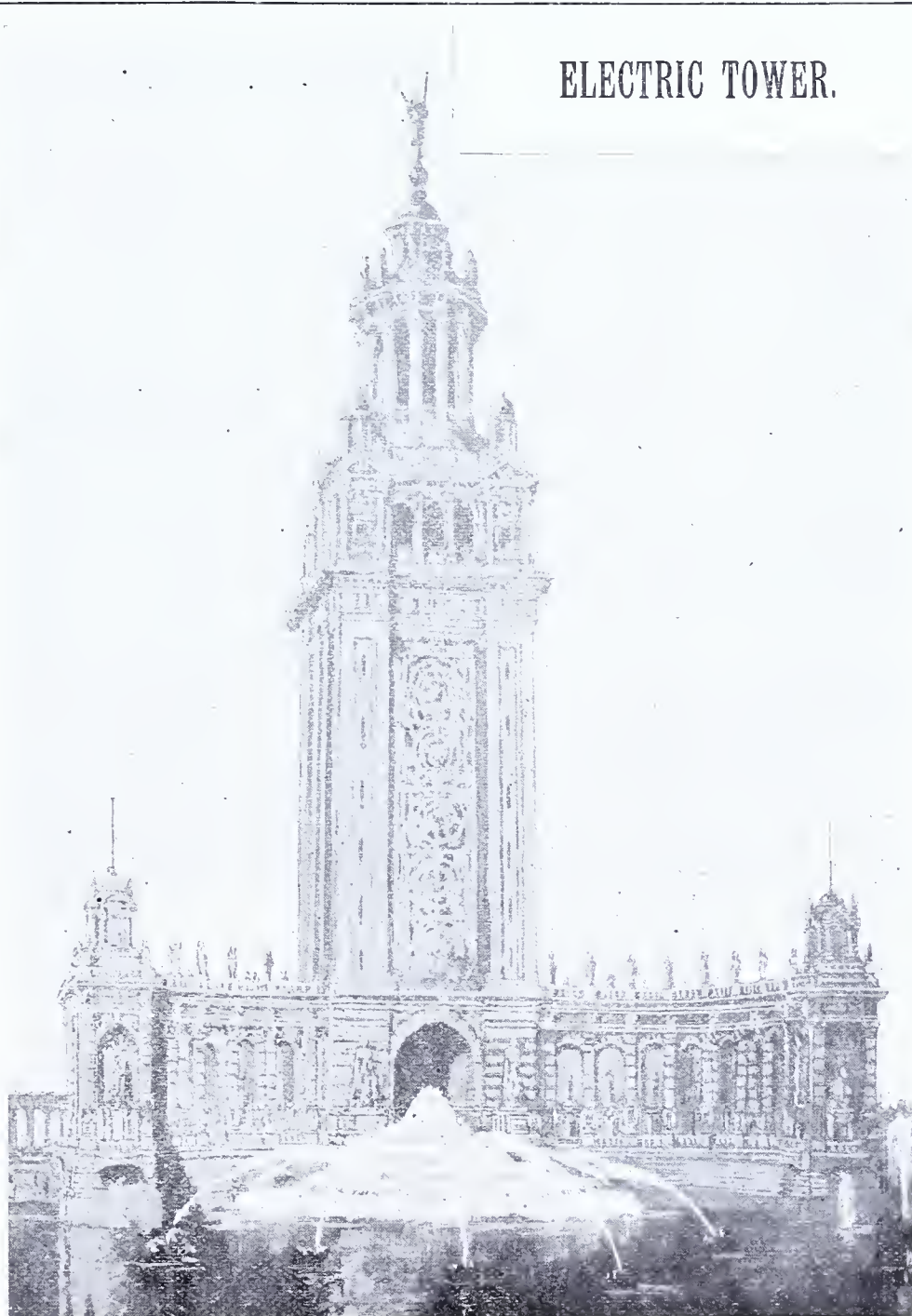
sils give off no heat. All of the heat is used in the cooking and not in warming and vitiating the air in the room. Instead of having to plan so that the cooking be done when the fire is in the range, the electrical kitchen is ready at any hour of the day or night to bake or broil, set the stew pan sizzling or the hot water urn to bubbling, brew the 5 o'clock tea, or disconnect the midnight Welsh rarebit from the fear that the alcohol bottle is empty and all the drug stores shut up; temper the chill of the spare bed or warm the toes under the desk; or heat the curling or the smoothing iron; all these appliances being connected by a flexible wire cord to a socket in the wall whence comes the energy. Finally, it is declared, apparently with reason, that meats broiled on the electric grid-iron are much more palatable than those charred and scorched in the ordinary way over hot coals.

**WIRELESS ELECTRICITY.**—Wireless telegraphy can hardly be called practical as yet, because of the difficulty of selecting the station with which it is desired to communicate and excluding all others. But a recent British application of the principle to control clocks seems to be of value. It is claimed that by this, it is possible for all of the clocks in a city to be simultaneously adjusted by one to which the necessary contrivance has been attached. To render a clock sensitive to the influence of the wave system it would be necessary to affix a re-

ceiving instrument with a coherer, an arrangement which might be extended not only to the public clocks, but to those of private residences. Then by means of a transmitter established at any point of the city, it would be possible to adjust every clock so fitted merely by the instantaneous pressure of a button.

**JOINTS IN ELECTRIC CABLE.**—A new method of making joints in heavy wires and cables has been brought out which combines simplicity and cheapness with highly satisfactory electrical qualities. When a joint is to be made for example, in an underground electric light cable, which is a rope of copper wires perhaps an inch in diameter, it is a difficult and costly job to scarf the ends and solder the wires together. On large cables the heavy mass of metal quickly conducts away the heat of a soldering torch, causing burning of the nearby insulation. The joints commonly made with solder are also points of electrical weakness. The new method is a cold process employing no solder. According to the new method, the two ends are butted in sleeves of soft copper and the jaws of a hydraulic press are set on the joint. One squeeze at a pressure of about forty tons to the square inch welds the sleeve and the cable into a solid mass, so that if the joint is sawed apart it is impossible to tell where the metal of the sleeve ends and that of the cable begins. Joints thus made are electrically and mechanically better than those made in the old way.

## ELECTRIC TOWER.



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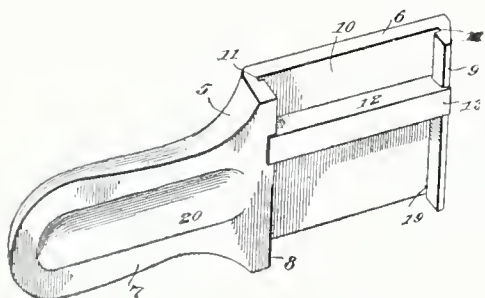


## CLEVER NEW PATENTS.

**Ingenious Devices Intended to Supply Long Felt Wants—Type Stick, Pleasure Railway, Hair Fastener, and Many Others.**

### Type-Setting Stick.

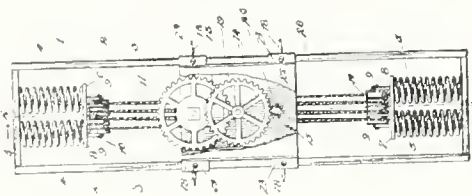
S. L. Long, of Magnolia, Minn, is the inventor of a novel form of type setting stick which seems to constitute a great improvement on the ordinary forms. A glance at the illustration clearly shows the construction of one of the non-adjustable sticks,



but the same mechanism can readily be applied to the adjustable form. In the cut, 12 represents the movable back, which is held in place by lips, 11, and flanges, 13, and by frictional springs set in the ends of the movable back so as to press against the surfaces 19 and 8. The movable back is slipped in at the top of the stick and pressed down by the typesetter's thumb until there is room above it for just one thickness of type. When this is set, another pressure of the thumb makes room for another line of type and so on, the type always being set at the very top of the stick. When the stick is full, the movable back is automatically checked by stop pins placed near the bottom. The advantage of always being able to set at the top of the stick is a great one and should commend the stick to those with whom rapidity of setting is an object.

### Spring Motor.

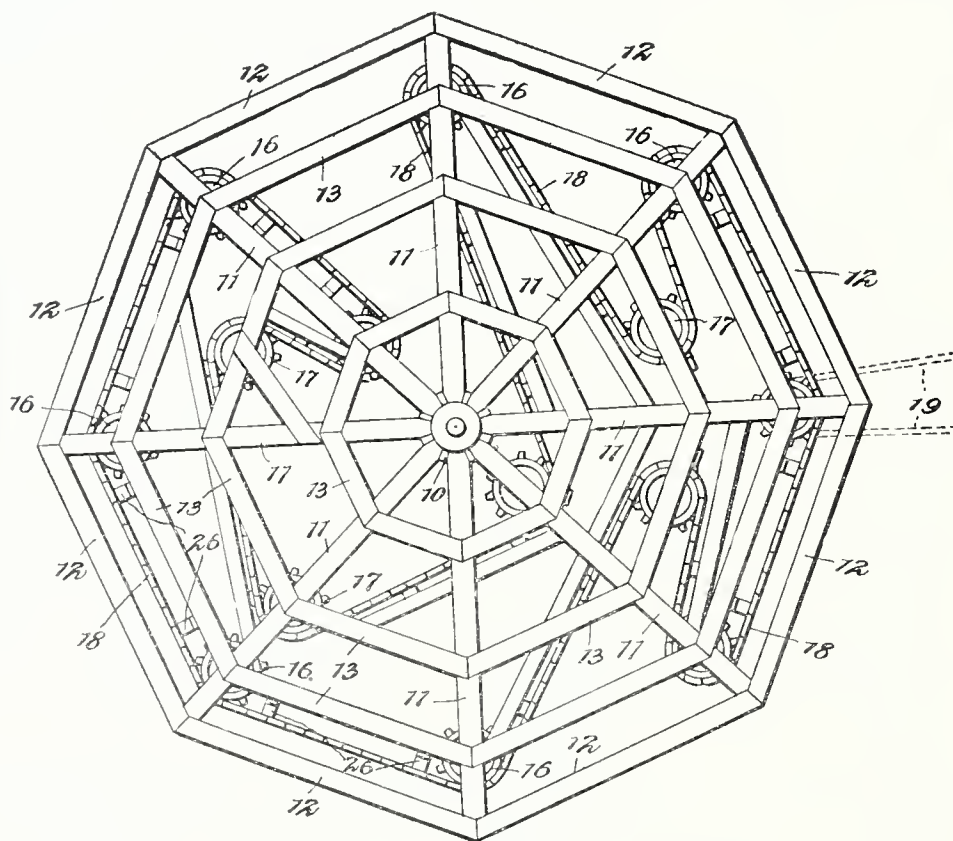
A simple, durable and inexpensive spring motor, which will extend the duration of its operation to the maximum limit, was recently patented by F. N. Silvey, of Crossroads, Ala. The illustration shows powerful springs set



in multiple at opposite ends of the motor case and connected with each other and with the mechanism in the center by a cord, the end of which is wound around a drum, concealed under the left pin wheel of the cut. This drum is connected by ordinary clock work gearing to the key shaft, 25. When wound up, the springs are drawn away from each other and of course tend to retract. By so doing they gradually unwind the cord from the drum, causing it and the driving shaft, 19, to revolve, thereby giving power to any machinery, such as a fan or other light apparatus, with which it may be connected. The multiple ropes of the pulleys cause a very small retraction of the springs to produce a comparatively large motion of the drum.

### Pleasure Railway.

Ferris wheels, merry go rounds, water shutes and roller coasters are all back numbers nowadays and the great public is crying for some other device which will give it a novel sensation. Inventors, of course, are quite ready to supply it with what it desires, and Edward Wishart, of Waterford, Penna, has certainly succeeded in doing so in his "Elevated Pleasure Railway," recently patented. The illustration shows a view of this looking down from above but gives little idea of the apparatus. The irregular double line, twisting about through it represents an endless chain from which seats, like those in an ordinary swing, are suspended. At each place marked 16 is a sprocket wheel round which the chain turns, thus

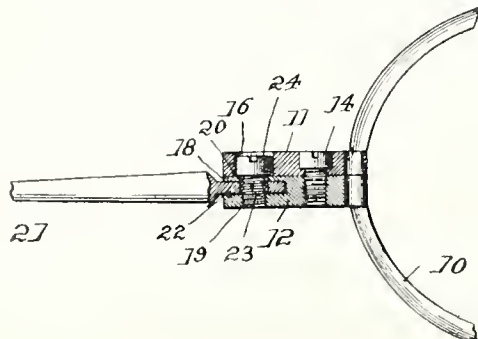


WISHART'S ELEVATED PLEASURE RAILWAY.

changing the direction in which the seats are travelling. It will be observed that the riders at times approach one another at high speed and then, just as they seem about to touch, turn and dart away as fast as they came, changing and turning in and out with kaleidoscopic variety. The sensation is pleasant and extremely novel and the new railway will certainly be a success. The power is communicated by a chain or belt at 19; 11 12 and 13 represent the frame work of the roof or tent which keeps off the rain and sun.

### Spectacle Frame.

Opticians and people who wear spectacles and who have, on occasion, tried to open the lens-frame to change the glasses, will welcome the device invented by John Currin, of Providence, R I., which is illustrated below. The lens-frame is made in the ordinary way with upper and lower end

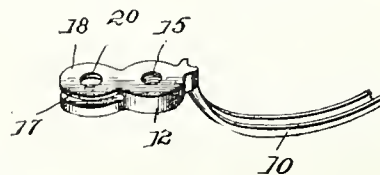


pieces, 11 and 12, which are clamped together by the screw, 14. The point of the invention lies in the slit, 17, into which the eye of the temple bow, 21, is slipped and made fast by the screw, 24. This screw does not engage the sides of the upper lens-pieces at all but slips freely up and down in the smooth cylinder, 16. If the screw, 14, be removed, the lens-frame can be opened without moving the screw, 22, at all. Thus, the lenses can be changed without the necessity of loosening the temple bows—a great advantage where quickness is required. Further, the temple bows can similarly be changed without loosening the screw, 14, which binds the lens-frames together. In other words, either lens or temple bow can be changed without loosening the other.

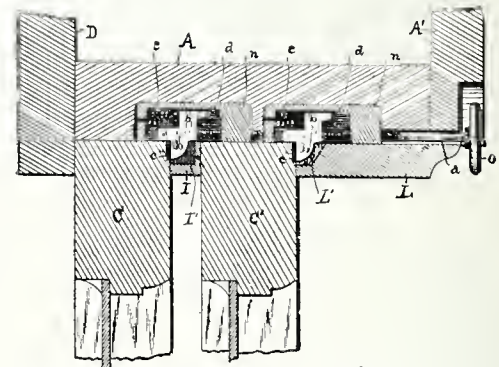
### Sash Lock.

Everybody who has been waked in the night—and who has not?—by a rattling window sash and has had to wander around, barking his shins and stumping his toes, in the endeavor to find a piece of paper which he could clumsily push between the sashes to stop their noise, will welcome the sash lock illustrated below. It is the invention of H. H. Kendrick, of Oswego, N. Y., and by means of it the sash can be made fast by a mere twist of the wrist.

Contrary to the general custom with sash locks, this one is fixed at the side of the window and not in the middle of it. The illustration shows a horizontal section through the window jamb and clearly illustrates the method of working. In it, *a* is a push bar, working in a nut set in the shoe, *n*, and controlling the "bite" *b, b*. When the knob, *o*, is turned, the push bar



moves forward and presses the bite, *b*, against the sash, *C*, at a point where a vertical metal strip, *c*, is set to receive it. When the knob, *o*, is turned in the opposite direction, the pressure



on the bite is relaxed and it is forced away from the sash by the spring, *e*. The outer sash is similarly controlled by an entirely separate though exactly similar mechanism. Thus the two sashes can be locked and unlocked independently of each other.

In another form of the same device, the push bar is worked by means of a cam disk, set beneath the knob, *o*, and is fastened or released by a half turn of the knob. This form does away with the necessity of a nut at *n*.

### Hair Fastener.

An invention that will really fill a long felt want has recently been patented by E. E. Mullinix, of Burlington, Kansas. It consists of a hair fastener and ribbon holder, designed to do away with the vexation so often occasioned to young girls by their long plaits coming undone. It is, however, equally applicable to the hair when loose, and is adapted to prevent the accidental disconnection or slipping off of a bow of ribbon or other ornament. It also permits a change of bows or ornaments without disarranging the hair.

The illustration shows part of the construction of the pin, which is both simple and cheap. It will be observed that, so far as shown, it does not differ essentially from the ordinary safe-



ty pin. Buried in the hair, however, and out of sight, is a double wire screw. This screw is first wound into the hair, (this can be done in less time than it takes to tell it,) then the bar, 8, of the pin is drawn across the hair, and the ring, 9, is hooked over the other end of the pin, 6, thus securing it beyond possibility of slipping.

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## OFFICER'S INVENTIONS.

Should They Belong to Them Exclusively or Should the Government Have a Share in Them?

The question of the moral right of army and navy officers to use Government workshops and Government materials to experiment with and perfect inventions, and then to patent them and sell them, perhaps to foreign nations, has again been brought up by the issue of a patent to Lieut. B. A. Fiske, of the navy, for an improvement in conning towers for warships, and his assignment of it to a western electrical company.

Mr. Fiske's device appears to be very valuable, even more so than his range finder, patented years ago, which is used all over the world nowadays and which pays him considerable dividends. His new invention provides means whereby an officer in a conning tower is enabled to see clearly what is passing outside, without the necessity of exposing himself. In the ordinary conning tower, narrow slits are provided around the several sides through which the officer looks to properly direct the course of the vessel. These towers are made very low and the slits are necessarily so narrow that they afford an exceedingly small range of view, so that most commanders prefer to remain outside where they can see clearly. This may lead to serious results, from the consequent loss to the ship which the wounding or death of its commanding officer at a critical moment would entail.

Mr. Fiske's invention consists of an arrangement of mirrors, something on the plan of a *camera lucida*. One of these is placed over the conning tower, which is open at the top, inclined at the proper angle to reflect the view around the ship down into another mirror within the tower. The upper mirror is hung on trunnions or pivots so that it may be tilted at various angles to the vertical or may be shifted about a vertical axis. A person within the conning tower may, by manipulating the mirrors, see the surrounding objects reflected in the lower mirror just as though his eye were located in the place occupied by the upper mirror. By means of a movable telephone, he can keep up constant communication with a central office, from which his orders may be transmitted in the usual way to the men at the engines, helm, and guns. The only fault to be found with this arrangement is that it throws fresh work on the commanding officer, who is already positively overwhelmed by the multifarious duties of his post.

The real question at issue now is whether Mr. Fiske is entitled, to reap the whole value of his invention, to the exclusion of the United States, which educated him for his profession and put within his reach all his facilities for experiment. It is well established that an employer has an equitable license to use in the line of his business, the invention of any employee who, during the course of his employment, used the tools and workshop of his employer to perfect his invention. In the present case, we

have a device invented by a public officer whose invention is directly in his line of duty and can only be of service to the government. Why then, should not the government be entitled to such an invention as much as in the ordinary case of employer and employee? Instead, the invention has been assigned to a company that will, if used at all, have absolute control of its manufacture and sale. Of course, the right of protection should not be taken entirely away from this class of inventors, else having no money incentive, there might be no inventions, and many meritorious devices might be lost. Some way should be provided, however, to prevent these inventions getting into the hands of outside parties who can absolutely control the articles and their prices. The question has become very serious, especially in the Navy Department, and action has been repeatedly requested by Congress along this line.

The last Congress took the matter up vigorously, the following bill having been passed by the Senate at the last session and is now awaiting the action of the House of Representatives:

"That whenever, in the judgment of the Secretary of the Navy, the public interests require the use in the naval service of any invention or discovery covered by letters patent issued to any officer of the Navy, whether retained in his ownership or assigned to others, said Secretary shall proceed to use said invention or discovery in the manner and to the extent required by such naval service, and such royalties and compensation as may be equitably due such officer, considering all the circumstances connected with the making of the invention or discovery, and especially all facilities in originating, working out, or perfecting the invention which the officer may have enjoyed by reason of his official position, may be recovered by suit brought by said officer in the Court of Claims. Said court shall make rules for the trial of such cases, conforming as far as may be with the rules established by the Supreme Court for the practice in courts of equity, and all cases shall be determined within one year from the filing of the petition therein, unless, in the discretion of the court, upon sufficient cause shown, the time is extended. The Secretary of the Navy is hereby prohibited from making any contract or payment for the use of any patent taken out by any naval officer."

The bill, however, seems to have omitted a very important provision. After the assignment of a patent the inventor has no further interest, the assignee being entitled to all the former's rights and benefits. But under the bill no right of action against the government is given to the assignee. In other words, if the United States uses an assigned invention there is no way for the assignee to obtain payment for same. The United States is thus put in the attitude of using private property for public use without compensation, and the courts, in consequence, would probably declare the bill unconstitutional as far as the assignee's interests were concerned.

B. G. Foster.



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## PATENTS

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# *Inventive Age*

## AND PATENT INDEX.

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### Editorial Notes.

A Portuguese paper gives details of an invention which is to greatly facilitate fox and badger hunting. It consists of a small electric lamp fixed on the collar of the dog who is to enter a burrow. The light is expected to frighten the animal, who is used to its dark hole, and drive it out to be captured. The invention is said to have been patented.

One of the latest triumphs of chemists, says a London trade journal, is the manufacture of alcohol from the smoke of blast and other coal furnaces. Coal smoke of the kind contains ethylene, from which alcohol is readily made by simple means, and it is recognized that ere long the smoke of high furnaces, coke ovens and gas works will be turned to account in this way.

A few specimens of bricks made of pumice, in small pieces cemented together, have found their way to this country. These are made and used to some extent in Italy and Germany and the pumice is of volcanic origin. The raw material is screened and the small pieces are covered by a thin coating of cement, and the brick is molded, the fragments adhering to each other. The brick is very light but not strong, and is adapted for use only for light partitions, pavilions, etc. Their great advantage is that they can stand great heat.

The Association of French Manufacturers for the prevention of Accidents to Employes has opened an international competition for insulating gloves for the use of working electricians. The gloves should serve as an efficacious protection to the hands and lower arm. They should be of substantial make, and capable of resisting not only electrical tension, but also accidental perforation which might be caused, for example, by the roughness of the copper wire. They should be easy and comfortable to wear, and should allow the fingers sufficient freedom for work. A prize of 1,000 francs will be given to the in-

ventor of the gloves which are pronounced to be the most satisfactory, or this sum may be divided among several competitors. The office of the association is at No. 3 Rue de Lutece, Paris, where additional information in regard to the competition may be obtained.

### Ericsson vs. Timby.

For years no one dreamed of questioning the supposed fact that the Monitor, which saved the Union fleet in Hampton Roads and possibly altered the result of the war, was the invention of John Ericsson. But this is an iconoclastic age and an organization of Boston women calling themselves "The Patriotic League of the Revolution" has set out to depose Ericsson and put another man in his place.

The league has what is said to be incontrovertible proof that Dr. Theo. R. Timby, who now resides in Washington, is the inventor of the monitor and that Ericsson was merely the engineer who had charge of the building. The league will ask Congress to recognize Dr. Timby as the inventor of the Monitor, and afterward will endeavor to have the fact stated in the school books now crediting the Swedish inventor. It will, however, be difficult to alter an alleged historical fact which has stood as long as this one has, whatever may be the rights in the case.

### The Telautograph.

A clever invention whereby it is said that one's handwriting may be unerringly reproduced at the end of a wire, irrespective of distance, has been perfected, and is about to be turned to practical account. Its owners have made arrangements with British telephone companies, so that subscribers to the latter may be allowed to work their telautograph instruments over wires ordinarily used for the transmission of sounds. The invention is an advance over the telephone in several respects. Sender and receiver can keep their communications perfectly secret, and any kind of writing can be transmitted; longhand, shorthand, cipher or sketches being reproducible with equal fidelity over any length of wire, the reproduction of handwriting being clear 500 miles away. One of the earliest uses to be made of the system will doubtless be for the transmission of notes of speeches from the reporter's table to the composing room. It should also facilitate the making of remittances, as it will be one of the simplest things in the world to sign checks by wire.

### Scene At White House.

There was quite a scene at the White House recently when Prof. Fignuccia, an Italian scientist of note, called there with a death-dealing bomb, which he insisted on presenting to the President. The situation was complicated by the fact that the professor could not speak a word of English and made known his wishes only by means of a note of a dozen words which he brought with him. The caller was short and swarthy—as villains always should be—and he was evidently an Italian, which might mean an Anarchist. When searched,

a mysterious brass projectile was found, evidently meant as an engine of death. By means of gestures the professor indicated how this would work. All that was necessary was to poke a wire in a hole, when, biff! bang! off it would go. Investigation disclosed that the professor's motives were entirely honorable. His somewhat theatrical advent at the White House was prompted merely by ignorance of official etiquette. He did not know that the Chief Executive did not spend his spare time in looking over models of patent bombs and in listening to glowing descriptions by their inventors.

### New England Inventors.

New England inventors still seem to be at the head of the profession, though the great middle west is fast gaining upon them. Their pre-eminence is largely due to the facilities for manufacture that New England has long had. The tendency nowadays is to guard the monopoly of a patent more securely than ever, for the profit in making any new device lies largely in the fact that it is a monopoly. With sixty days' notice, in a state like Massachusetts, it is possible to equip a factory with men and tools for duplicating almost any kind of a patent, and, with competition, the incentive to manufacture is largely taken away. The factories are constantly on the watch for some new invention, of which they can have a monopoly, or which can, at least, be used as a leader in their trade. The most progressive are continually adding improvements, the products of inventors, to their machinery. They sell at exactly the same prices as do their competitors, but throw in free the improvements covered by these patents. This cuts down profits, but increases business, and in the long run these firms not only make large amounts of money but keep ahead of all their rivals in the trade.

### New Use For Cement.

Some time ago, the world was horrified by the news that one of the bridges from the inside to the outside of the Paris exposition had collapsed, killing a number of persons. Investigation disclosed that the bridge had been constructed of "*ciment armee*," or "steelled cement," a new French invention, which is said to have a great future before it when scientifically constructed, despite the set-back occasioned by this unfortunate accident.

Generally speaking, "*ciment armee*" consists of a metal frame or skeleton filled in with mortar or cement concrete. In the bridge in question the platform was composed of a network of metallic wires shut up in a thick bed of cement or concrete, the wirework forming a skeleton to which the cement gave consistency. Up to the present, cement concrete had been used only for the beds of foundations, walls and pillars and those works which have to oppose a vertical resistance to a weight or pressure; and no one would have thought of employing it for the construction of footways, terraces or balconies having no apparent support, for they would unfailling-

ly be broken by even a light weight. But, by introducing a metallic netting, forming braces or a skeleton, into the mass of cement-concrete, so great resistance and stiffness have been imparted that it is said that the most heavily burdened floors and the boldest projections can now be made most successfully by the process. In this case, the "steelled cement" offers a greater strength than even an iron construction of the same dimensions, and this strength is twenty-four times greater than that of ordinary cement concrete.

### Foreign Trade-Marks

Two recent reports to the State Department discuss the subject of trade-marks. The first is from Consul Ingersoll at Copenhagen, Denmark, who says: "I deem it of importance to direct attention to the trade-mark laws of this country. Under the Danish law, a trade mark is granted four months from the date of filing the application, but any person, having already registered a similar trade-mark in another country, may apply here and the mark will be registered in the name of the person to whom such trademark has been granted, the registration upon behalf of the Danish applicant being refused. The American manufacturer whose trade-mark has not been registered here runs the risk of having it taken away from him by any unscrupulous person who intends to put an imitation of American goods upon this market."

The second is from Minister Bryan, at Rio Janiero. He says that he has protested against the Brazilian law enacted last November, forbidding the importation of manufactures that do not carry labels, prescriptions or trade-marks in Portuguese or partly in that language, as this law would cause serious loss to importers of United States proprietary medicines. The 1st of July was named as the date for putting the law in effect, but Mr. Bryan has obtained a postponement until October 1, and hopes that Congress will repeal the law. Mr. Bryan argues that labels are a part of trade-marks, and that consequently the law is in violation of the convention of 1878 between the United States and Brazil. He advises all American importers to conform to the requirements of that agreement, by registering their marks in Brazil.

### Pneumatic Tools.

Among the more recent developments in labor saving appliances, a high place should be given to pneumatic tools, especially portable ones, for they have solved more than one difficulty confronting engineers and manufacturers. Until their appearance in the workshops, manufacturers had the alternative of drilling, boring and chipping, by the slow process of hand labor only, or else of transporting the heavy material to be operated upon to and from the machines. Compressed air is of course dependent upon steam for its very existence, but once made and stored in a compressor it has possibilities more far-reaching than any to which its creator has been able to directly attain. One of these is portability, and it is this which has







## MECHANICAL INVENTIONS AND DESIGNS

Patents for which were recently procured through the Patent Soliciting Department of E. G. SIGGERS, Washington, D. C.

John F. Lewis, Oxford, Ind., Straw Stacker Attachment.—In the ordinary pneumatic stacker, the blast carries the straw a considerable distance beyond the hood of the stacker and therefore spreads it over a large area. This objection is entirely obviated by the present invention, which comprises an adjustable baffle suspended in advance of the hood. This baffle arrests the straw, but permits the blast to pass freely. At the same it may be adjusted at any desired angle according to the size and shape of the stack that is to be used.

Emilien Rousse, Pike Creek, Ontario, Canada. Fanning Mill.—This invention is a great improvement in this line. Among the various advantages, it may be mentioned that the screens are arranged to act independently and are adjustable. Mechanism is provided for keeping them free from refuse and from clogging. Means are also arranged by which the cleaned grain is delivered to a bagging mechanism, thus saving the handling of the grain.

David Miller, Garden City, Mo. Gate.—This invention relates to the class known as "jump gates", wherein the gate is raised bodily and projected forward across the road to open the same, or operated in the opposite direction to close it. It is an improvement on a former patent to the same inventor, and comprises a less expensive construction with an increase of strength and durability. Means are also provided for locking it against accidental displacement, and it is so arranged that there is no chance of its becoming inoperative because of freezing.

Frederick H. Oehlke, Lorain, Ohio. Shut-off for Gasoline Burners.—The present invention provides simple means whereby a vapor burner is automatically closed should the flame from any cause be extinguished. It consists of a thermostatic tube having a valve seat and a valve stem fixed within the tube, and having a valve which fits tightly in the valve seat when the tube contracts from the extinction of the flame.

Daniel Rhodes, Washington, D. C. Nut Lock.—The nut is composed of two separable parts, an outer nut proper and an inner wedge-shaped threaded bushing which fits within the same and screws upon the bolt. By this simple construction, when the nut is screwed home, the bushing will tightly grip the threads of the bolt and thereby securely retain the nut in place and prevent its working loose by reason of the vibration to which it may be subjected.

John L. Williamson, Pulaski City, Va. Fire-Back for Stoves.—A supplemental plate or shield is provided, which is adapted to be arranged over the fire-back and prevent the same from becoming excessively heated, warped or burnt out. The shield also causes the lining to be uniformly heated. As it is not attached by bolts or like fastenings, it may be easily and quickly removed and replaced at slight cost.

Mrs. Lizzie Adams, Vancouver, Wash. Wardrobe.—The present invention comprises a wardrobe that can be compactly folded so that it may be easily transported from place to place.

The several parts are of simple construction, and the arrangement is such that when in a collapsed condition, there is no chance of any of the parts becoming separated and lost.

Nicklas H. Bloom and John F. Loos, Nashua, Iowa. Harrow.—In this machine, the harrow has draft devices at both ends, and the harrow bars are so connected that when the harrow is drawn in one direction, the teeth will automatically adjust themselves to a vertical position, and when drawn in the opposite direction the teeth will be automatically given a rearward inclination. By this means an inexpensive but efficient device is constructed, which may be used with equal advantage in soft or loamy soil or in sticky or clayey soil.

Erasmus T. Clark, Danville, Ind., Gate.—This invention comprises a swinging gate and means for operating the same, consisting of a rockshaft extending on each side thereof, parallel with the road, and connected with the gate by simple mechanism whereby a person, without alighting from a vehicle, by operating the rockshaft, may open the gate and close it again after passing through. The gate is simple, and all operating mechanism is so located that there is no liability of its becoming frozen in cold weather.

Frank B. Duffey, Los Angeles, Cal., Gas Burner.—The present invention relates to vapor burners, wherein hydrocarbon oil is vaporized and burnt in the form of gas. The construction in this invention brings the ignited gas against the vaporizer, whereby the latter is kept in a highly heated condition. This facilitates the generation of the gas and obviates the liability of the burner to become clogged, at the same time it increases the illuminating power. The value of these advantages will be readily understood by those skilled in the art.

Henry O. Gadberry, Carthage, Mo. Rotary Engine.—A rotary piston provided with a sliding abutment is eccentrically mounted in a circular casing. A sliding cut-off valve is arranged to be operated as the piston rotates and is provided with an adjustable connection whereby the movement of the piston may be regulated. This provides an efficient form of engine that is simple and capable, of a very high speed.

William Harmon, Bartow, Fla. Polycycle.—This invention comprises a machine which can be arranged to carry one or more riders as desired, or may be used for transporting packages and parcels of various kinds. The construction fully meets these requirements and can be readily adapted to the load carried and for climbing grades, thereby enabling the rider to propel the machine with equal ease on level and steep surfaces and with a light or heavy load.

James L. Kerstetter, Bradford, Pa. Ink Well.—A completely enclosed reservoir is connected at one end with an open well by means of a passage having a graduated top. In this well is seated a hollow plug which can be rotated and which is provided with suitable openings through one side. These are adapted to align with the graduated passage, and thus the quantity of ink in the well may be regulated or shut off altogether, preventing evaporation and effecting a great saving of ink.

Calvin Ogburn, Phoenix, Arizona. Acetylene Gas Generator.—In this invention, a construction is provided having a minimum number of parts and simple means for insuring a uniform generation of gas with perfect safety. New means are provided for supplying water to the carbon and to

the water tank, and the machine is so constructed that the gas is thoroughly dried and cooled before it passes out of the same.

Reddin W. Parramore, New York. Hose Supporter.—This device consists of a belt adapted to surround the wearer, and includes a continuous strip crossed near its ends and hose-sustaining straps secured to and depending from the ends of the belt. A device is provided to fasten the belt at its point of intersection so that it is maintained in proper position, the whole forming a very convenient and efficient hose supporter.

Walter E. Mayo, Montpelier, Ind. Carton.—A tubular body is made from a piece of cardboard or other flexible material bent to cylindrical form, and having its edges united by a separable strip which can be easily severed to open the body to a flat condition and thus display advertisements which may be printed thereon.

Ralph R. Spears, Wheeling, W. Va. Machine for Doubling Metal Plates.—In this invention a machine is embodied for doubling metal plates prior to their rolling, in order to obtain the proper thickness. This has ordinarily been done by hand at considerable expense, and being unavoidably inaccurate, has heretofore been a comparatively expensive operation. This machine overcomes these difficulties by providing simple and efficient mechanism whereby the doubling of the plates is steadily, quickly and accurately accomplished.

Ralph R. Spears, Wheeling, W. Va., Machine for Doubling Metal Plates.—This invention goes a step beyond the above patent and provides, besides a new and efficient means for doubling the plates, mechanism for accurately trimming the edges thereof and thereby placing the same in proper condition for immediate delivery to the heating furnace, thus greatly economizing the time usually required for doubling and shearing tin and other sheet metal plates.

Edwin T. Stuart, Ottawa, Kansas. Envelope.—By this invention an envelope is provided that cannot be tampered with or surreptitiously opened without detection. The sealing flap is provided with a tongue that interlocks with a pocket-forming tongue, so that the fastening tongue is not free or exposed for a malicious person to lift the edge of the sealing flap and open the envelope by steaming the adhesive material or by any other process.

Fremont G. Williams, Brattleboro, Vt. Vehicle Running Gear.—The running gear in this invention is of novel and simple construction and is designed to be arranged at the front of a vehicle having a drop body, in which it is impossible to employ a reach. It enables a vehicle having this invention applied, to be turned short without the springs coming in contact with the drop portion of the body, an advantage that will be highly appreciated.

Calvin F. Besore, Ida Grove, Iowa. Clothes Wringer.—A flexible roller formed upon a spring core is used in connection with a stiff roller of ordinary construction. Sectional pressure rolls are arranged over the flexible roll so as to impart a uniform pressure thereto. By this construction, when clothes are passed through the wringer, the flexible roller will yield at any point to allow buttons, knots, or other obstructions to pass through, without breaking or injuring the same and without injuring the machine.

John E. Caps, Kansas City, Mo. Printing Press.—This invention pro-

vides an attachment that may be used in connection with any ordinary printing press for printing advertisements on wrapping or bag paper, and comprises means driven in unison with the impression devices of the presses so that variously tinted stripes or designs may be applied simultaneously with the work of printing the advertisement.

David Gilliland, Harper's Ferry, Iowa. Straw Stacker.—A folding stacker is arranged to be folded compactly and carried upon a truck separate from the threshing machine. The device is so arranged that it takes up but little room and obviates the necessity of loading it upon the machine. It furthermore provides means whereby it can be easily and quickly placed in operative position with relation to the machine.

Warren H. Gould, Manchester, N. H. Composition for Paint and Cement.—This paint is an entirely new composition that is found to give excellent results when used upon tin, iron or wood, where a suitable protection is desired from the effects of the weather. It makes a very fine quality of cement also, by varying the proportion of the ingredients.

William Handler, Jerseyville, Ill. Attachment for Beer Dispensing Apparatus.—This improvement contemplates a very simple anti-froth device, which is applied to the conducting tube between the barrel and the dispensing faucet, the device operating to retard the froth, while permitting a ready flow of the liquid, thereby equalizing the amount of froth delivered with the liquid from the first to the last glass drawn from the vessel. This overcomes a great difficulty existing, in which the first beer drawn is mostly froth and toward the last there being no froth, conditions which are very undesirable to consumers.

Wilson F. Hutchison, Orange, Texas. Oscillatory Engine.—The present invention is a marked improvement in this style of engine. A construction and arrangement of parts is provided whereby the engine cylinder is mounted for oscillatory movement, the bearing being disposed exteriorly to avoid all interference with the working parts of the engine. A further improvement lies in an improved construction of valve mechanism whereby the engine is made very simple and practical.

Virgil A. Jones, Waverly, Nebraska. Mail Crane.—This apparatus, which includes in its construction a crane which carries pouch-transmitting and receiving mechanism, is applied to railway cars so that mail bags can be taken onto trains while the same are rapidly moving. The necessity of manually discharging the bags is thus avoided, so that there is no chance of their lodging in mud and snow or falling beneath the car wheels and being destroyed.

Patrick J. Mulloy, Ardoch, N. D. Spice Cabinet.—A number of receptacles are mounted upon and around a single standard. At the lower end of each receptacle is provided a novel delivery device by means of which the delivery may be indicated so that subsequent weighing is avoided. This device is a necessity to all progressive storekeepers, as it is a great time and labor saver and is unique and attractive.

Oscar E. Nickey, Big Springs, Tex. Water Filter.—The present invention is an improvement upon a former patent to the same inventor. The device is an absolutely reliable and safe filter that is self cleaning. One of the principal advantages of the filter resides in means whereby the filtering materials can be compressed as desired to suit the water pressure.



## IMPORTANT COURT DECISIONS IN PATENT AND TRADE MARK CAUSES.

### United States Circuit Court of Appeals—Second Circuit.

FULLER v. HUFF *et al.* Decided July 5, 1900.

1. TRADE MARK—"HEALTH FOOD"—DESCRIPTIVE.

The term "Health Food" means healthy food or health producing food and is therefore descriptive of quality, and cannot be a technical trade-mark, either with or without the word "Company," any more than the words "Nutritious Wine" could be a valid trade-mark.

2. TRADE-NAME—UNFAIR COMPETITION.

The law of unfair competition is that when a mark, name, or phrase has been used by a person in connection with his business or articles of merchandise so as to become identified therewith and indicate to the public that such articles emanate from him, the law will prohibit others from so using it as to lead purchasers to believe that the articles they sell are his or as to obtain the benefit of the market he has built up thereunder.

3. SAME—SAME—LONG-CONTINUED USE.

The courts in considering the use by competitors of the name under which a rival has previously gained a business reputation, although the name is not strictly a trade-mark, have attached great importance to long-continued and exclusive priority of use and have demanded a high order of commercial integrity and have frowned upon all filching attempts to obtain the reputation of another.

4. SAME—DIFFERENT STYLE OF PACKAGING.

If a trade-mark has been so identified with the business of a manufacturer as to inform the public that the name upon goods means that they are the product of that person, and another adopts and displays the name, it is not material that he has not also adopted the particular dress in which his predecessor has presented his goods.

5. UNFAIR COMPETITION—CONTINUANCE AFTER NOTICE.

Although the intent of the defendant when it commenced the use of the name may have been innocent, the continuance after it had learned of the complainant's prior use indicates its deliberate intention to use the name without reference to the complainant's possible prior rights.

6. TRADE-NAME—"HEALTH FOOD COMPANY" AND "SANITARIUM HEALTH FOOD COMPANY"—LIABILITY TO DECEIVE.

The use by the defendant upon goods of the name "Sanitarium Health Food Company," although in connection with the words "Battle Creek, Michigan," is likely to deceive purchasers and make them believe that they are obtaining the goods of the complainant sold under the name of "Health Food Company," and therefore an injunction will be granted. It is not necessary to show that a purchaser had actually been deceived where a manifest liability to deception exists.

NATIONAL STARCH MANUFACTURING COMPANY v. DURYEA, *et al.* Decided, February 28, 1900.

TRADE-NAMES—"DURYEA'S STARCH"—DIFFERENT LABELS AND PACKAGES—UNFAIR COMPETITION.

Duryea, the president and a stockholder of the Glen Cove Manufacturing Company, which sold starch in packages having thereon the name "Duryea's Starch" in prominent letters, the name of the company and a picture of the manufacturing buildings, sold the business, trade-marks and good will of the company to another company which used the packages containing the name and picture with its own name as manufacturer, Duryea in making the sale agreeing

not to go into the starch business for five years. At the expiration of that time he furnished capital to his sons, who formed a partnership with others and sold starch as "Starch prepared by Duryea & Co.," but used different labels and packages, the starch being prepared in accordance with directions given by Duryea senior. *Held* that this was a proper use by Duryea and his sons of their own name and that they could not be enjoined.

### Ninth Circuit.

N. K. FAIRBANK COMPANY v. LUCKEL, KING & CAKE SOAP COMPANY. Decided May 7, 1900.

1. TRADE-MARKS—INFRINGEMENT—"GOLD DUST" AND "GOLD DROP."

*Held* that the name "Gold Drop" used by the respondents to designate washing powder, is an infringement of the plaintiff's trade-mark or trade-name "Gold Dust," notwithstanding a dissimilarity of the labels, character of symbols, and size of packages.

2. SAME—TRADE-NAME DISTINGUISHED FROM TRADE-MARKS.

There are two kinds of trade-marks—one of peculiar pictures, labels or symbols, the other in the use of a name. The first appeals to the eye and the second to the ear. To constitute infringement of a trade-name, it is not necessary that there should be similarity in appearance, but merely such similarity in the names that the ordinary purchaser having no knowledge of the appearance of the package or label would be deceived by the name and induced to purchase an article under one name supposing it to be the other.

### U. S. Court of Appeals for the Dist. of Columbia.

DARNELL v. GRANT. Decided June 12, 1900.

1. INTERFERENCE—PRIORITY—REDUCTION TO PRACTICE—DILIGENCE.

Where it is admitted that G. actually reduced the invention to practice in June, 1897, and he is entitled to constructive reduction to practice by filing his application in August, 1896, he is entitled to the decision on priority, even if it be conceded that D. had a conception of the invention prior to that time, since D. has not shown an actual reduction to practice at any time nor diligence up to the time when he filed his application a year later.

2. SAME—REDUCTION TO PRACTICE—ADMISSION OF OPPOSING COUNSEL.

Where G. testifies to the construction and successful use of certain machines embodying the invention in June and July, 1897, and, in order to shorten the matter of taking testimony, counsel for the opposing party admitted on the record that the machines were made and used substantially at the time and in the manner testified, *Held* that G. is entitled to the date of June or July for a reduction to practice of the invention.

3. SAME—SAME—EXPERIMENTAL MODEL.

Where D. testifies on direct examination that he worked on a full-sized machine from 1896 to 1898 and completed it and successfully operated it in July, 1898, but on cross-examination admits that the machine was far from being complete and operative, and that it had only been used as an illustration and was nothing more than an experimental model, *Held* that it cannot be received as a reduction to practice.

4. SAME—DECISION OF THE COMMISSIONER OF PATENTS AFFIRMED.

Where D. may have been the first to conceive the invention, but G. was the first by a year to reduce it to practice, and D did not show diligence during his delay, *Held* that the decision of the Commissioner of Patents in favor of G. was correct and will be affirmed.

### DECISIONS OF THE COMMISSIONER OF PATENTS.

EX PARTE JOHNSTON. Decided June 1, 1900.

1. DIVISION—GRINDING-MACHINES.

*Held* that division was properly required between claims to a truing de-

vice and claims to the grinding mechanism of a machine for grinding knives where the devices are useful in other relations and have acquired a distinct status in art and manufacture.

2. SAME—COMBINATION AND SUB-COMBINATION.

It is not broadly true that in all cases where a party makes and is entitled to a combination claim, he is also entitled in the same case to claim as many sub-combinations or specific elements in the combination as he desires.

3. SAME—SAME.

Where the specific elements or sub-combinations in a general combination are useful in other relations and are mere improvements on independent devices which have acquired a distinct status in art and classification, they cannot properly be retained in the same case as the combination claim.

EX PARTE ABERLI. Decided March 26, 1900.

1. EXAMINERS-IN-CHIEF RECOMMENDING CHANGE OF CLAIMS—JURISDICTION.

Where an applicant appealed a claim to the Examiners-in-Chief for a process and they affirmed the action of the Examiner in rejecting the claim, but recommended the allowance of a claim for an implement, *Held* that they exceeded their jurisdiction in making such recommendation.

2. SAME—SAME—PROCESS AND APPARATUS.

The applicant having prosecuted his claims for a process is as much bound by his election as though he had originally presented claims for a process and an implement or apparatus and, upon requirement for division, had elected to prosecute the process claims.

3. SAME—SAME—SAME—RULE 41.

To permit this applicant now to present claims in this application for a device, as recommended by the Examiners in Chief, would be an evasion of Rule 41 and not an advisable precedent to establish.

EX-PARTE ROBY. Decided July 13, 1900.

DIVISION—MOTOR-VEHICLE.

*Held* that division was properly required between claims to; first, the steering and controlling devices; second, the motor and means for mounting; third, the frame; and, forth, the driving-gear of a motor vehicle, since the devices are independent of each other in structure and operation and may be used in other relations.

JONES v. LARTER. Decided June 1, 1900.

1. TWO PATENTS TO THE SAME INVENTOR FOR THE SAME INVENTION.

Where an application covering a certain device is pending when another application is filed by the same party covering improvements on it, and six months after a patent issues on the

first application, broad claims, which could have been made therein and differ only in scope from those actually made, are inserted in the second application, *Held* that the claims cannot be properly allowed, since to allow them would be, in effect, to grant a re-issue with a broader claims and at the same time extend the term of the patent.

2. SAME—CO-PENDING APPLICATIONS—BROAD AND NARROW CLAIMS.

It has been held that where broad claims are made in the case first filed and while that case is held up in the Office through no fault of the applicant, a patent on specific improvements is granted, a patent subsequently granted on the first cases is valid; but the decisions to that effect do not apply, and were not intended to apply, to a case where the broad claims were not only made in the second application filed, but made therein long after the patent had issued on the first application.

3. SAME—SAME—FAILURE TO CLAIM—DEDICATION TO THE PUBLIC.

The presumption of a dedication to the public is raised by a disclosure of matter in a patent without a claim to it, and, while this presumption may under certain circumstances be overcome by having a co-pending application claiming it, it is not overcome by an application which does not, and was not intended to claim it, merely because the claims are inserted therein long after the patent on the other case issues.

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Pocket recorder.....E. M. Long  
Pool ball.....G. B. Burt  
Potato digger and gatherer.....A. Dambacher  
Pressure generator.....I. M. Uppercu  
Pretzel making machine.....C. Betz  
Printing machine.....J. L. Firm  
Propelling mechanism. Ship.....K. P. Hangl  
Pulley. Expandable.....E. B. Farham  
Punch. Combination ticket.....W. C. Downing  
Punching bag.....J. Gaubie  
Punching machine. Rasp.....J. A. McHardy  
Puzzle.....A. C. Booth  
Puzzle or trick device.....H. A. Wright  
Puzzle or trick device.....M. A. Butler  
Railway cattle guard.....R. F. Adams  
Railway crossing.....J. S. Jenckes, Jr  
Railway. Elevated pleasure.....E. Wislart  
Railway switch setting device.....G. W. Mockabee  
Railway track.....T. H. Gibbon  
Railway vehicle coupling.....A. Piskur  
Raisin seeder.....F. H. Peterman  
Ratchet drill.....B. S. Williams  
Refrigerator and refrigerant.....S. H. Emmens  
Refrigerating apparatus.....C. J. Coleman  
Refrigeration system.....C. J. Coleman  
Refrigerator.....C. F. Kade  
Refrigerator.....R. H. Reeves  
Register.....E. Davis  
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Roof.....G. Bruck  
Rotary cutter.....C. S. Locke  
Rotary engine.....S. A. S. Porter  
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Rubber covered article.....F. J. Newbury  
Sash fastener.....S. J. Johnson  
Sash lock.....D. Lloyd  
Saw frame. Buck.....L. E. Eickelberg  
Saw. Metal bench.....C. E. L. Shroule  
Saw set.....H. W. Eicher  
Sawing machine. Wood.....W. Hindley et al  
Scale loop.....E. Finn  
Scraper.....W. H. Onion  
Seat for shop assistants, &c.....J. B. Bruce  
Seeding machine.....M. Zollner et al  
Sewing machine.....H. P. Richards  
Sewing machine. Hemstitch C. M. Abercombe  
Sewing machine mechanism.....F. W. Merrick  
Sharpener. Disk.....G. Meinhardt  
Sharpener. Disk.....J. J. Smith  
Sharpening apparatus.....G. F. Barnett  
Ships. Hull for.....C. Andrade, Jr  
Shoe polishing cabinet.....A. L. Overcashier  
Shuttle.....2 pats.....E. Oldfield  
Shuttle guiding device.....P. Schmidt  
Sifter. Ash or coal.....W. Walter et al  
Sign. Advertising.....E. Bannes  
Sign. Illuminating.....S. Evans  
Skate.....H. Taylor  
Smokeless furnace.....F. M. Reed  
Smokeless furnace.....F. M. Reed et al  
Snap hook.....G. W. Brown  
Snap hook.....J. S. Cotton  
Soap preparation.....T. Weyl  
Soda. Production of.....J. B. Entz  
Sole and heel. Boot or shoe.....G. F. Butterfield  
Sound transmitting device.....C. Salmon  
Sound transmitting apparatus.....E. Toxey  
Sowing machine. Seed.....J. Green  
Spark catcher.....N. Kershner  
Spectacle frame.....J. Currin  
Sputoon. Centrifugal fountain.....P. Frazer  
Splint.....J. G. Hughes  
Spraying device and torch.....R. B. Williamson  
Square and bevel. Combined.....M. Setzer  
Stanchion. Cattle.....W. D. Case  
Steam boiler.....G. Ebeling  
Steam. Drying exhaust.....L. F. Baldwin  
Steel ingots. Treating.....J. H. Carpenter  
Steel. Making blocks of.....L. Perin  
Stereotype plate trimmer.....H. Winter  
Sterilizer and filter. Liquid.....W. M. Deichler  
Stirrup. Elastic.....W. A. Neal  
Stitch separating machine.....J. B. Hadaway  
Stopper for atomizers.....J. Abtze  
Stove. Vapor.....L. Stockstrom  
Strapping tool.....W. Max  
Street sweeper and cleaner.....J. A. Paige  
Stud for garment supporter.....L. D. Draper  
Supplying machine. Automatic.....W. Jaeger  
Surgical pad.....T. Campbell  
Swinging gate.....W. R. White  
Syringe.....W. A. Armour  
Syringe, injector, &c.....J. B. Walker  
Tag. Bicycle.....E. J. Cole  
Tapping device.....H. Nadorff  
Telephone exchange system.....W. Smith  
Telephone mouthpieces. Cleaning.....M. N. Clark  
Telephone repeater.....reissue.....W. M. Davis  
Telephone switch.....O. Plummer et al  
Telephone switchboard device.....J. J. O'Connell

Thill coupling.....A. L. Grant  
Threads. Clearing silk.....C. G. Diederichs et al  
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Time indicator. Workman's.....L. E. Voorhees  
Time recorder. Electrical.....E. Davis  
Tire for vehicles. Rubber.....C. H. Wheeler  
Tire heating device. Wheel.....H. D. Johnson  
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Tire. Pneumatic.....J. A. Jones  
Tobacco pipe.....A. McIntyre  
Tool box.....D. A. Jones  
Tool. Machine.....R. K. Le Blond  
Top.....O. Benson  
Toy.....O. Kord  
Toy. Mechanical.....G. Wales, Jr  
Trousers.....W. G. Turner  
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Trunk. Convertible.....A. L. Kahn  
Trunk lock.....C. G. Johnson  
Trunk. Wardrobe.....T. J. Hamilton  
Tug. Shaft.....J. O'Connell  
Type distributor.....E. F. Nydahl  
Type setting apparatus.....L. K. Johnson et al  
Umbrella carrying device.....M. H. Cochran  
Umbrella rib and stretcher.....J. A. Bedel  
Vaccinating instrument.....L. A. Denis  
Valve. Hydraulic machinery.....J. K. Smith  
Valve. Inflation.....C. E. Bown  
Valves. Operating device for.....F. S. Newman  
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from sunken.....S. Lake  
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Washers. Making.....H. C. Hart  
Washing machine. Clothes.....Z. Gaillard  
Water heater controller.....M. A. Adam  
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Water.....J. D. Brotherston  
Water. Purifying.....C. H. Koyle  
Water purifying apparatus.....4 pats.....C. H. Koyle  
Water tube boiler.....L. Tugan  
Water wheel.....W. T. Hoffman  
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Weeding tool. Hand.....W. L. Faxon  
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Windmill gear.....G. J. Moore et al  
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Air purifier and muffler.....H. L. Brown  
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Ashes from marine vessels. Device for remov-  
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Balloon. Electric traction.....M. J. A. Deyder  
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Bicycle seat post.....J. H. Gash  
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Bicycle repair jack.....M. A. Masters  
Bicycle tube clamp.....P. L. Hussey  
Bill hook.....W. Hornich, Jr.  
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Blower. Grate.....J. S. Roark  
Boat fastening device. Ferry.....W. O. Jones  
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Book cover.....E. M. Page  
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Bottle cap.....A. L. Bernardin  
Bottle. Mucilage.....W. Rodiger  
Bottle. Non refillable.....G. S. Linthicum  
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Cable grip. Traveling E. I. Parsons (Reissue)



Camera for color photography.....W. N. L. Davidson  
Car bicycle carrier, Street.....A. Hunter  
Car brake.....R. W. Ennis  
Car brakes, Apparatus for Automatically applying.....S. F. Woodworth  
Car coupling.....S. M. Brooks  
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Cartridge clip.....J. P. Lee  
Caster, Ball.....W. P. Pink  
Casting door checks of seals, Device for.....E. L. Torsch  
Chain.....J. H. Barry  
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Chest, Silver or cutlery.....T. G. Walpuski  
Cigar cutter.....G. S. Eldred  
Clothes line pulley.....H. W. Teal  
Clothes pounder.....C. L. Cole  
Clothes pounder.....C. L. Cole  
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Clothes sprinkler.....F. W. Merritt  
Coal conductive, &c. Rendering anthracite.....W. J. Burke  
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Contact brush.....S. L. Neely  
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Coupling.....J. W. Pettijohn  
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Grate for tilting demijohns.....G. W. Banker  
Crucible tongs.....W. C. Newell  
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Curtain fixture.....R. McCullough  
Dead centers, Device for.....J. Martin  
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Dyeing apparatus, 2 pats.....W. Mather  
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Egg beater.....E. R. Godward  
Electric machine controller, Dynamo.....H. H. Cutler  
Electric thermostatic cables, Reel or spool.....J. D. Gould  
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Elevator car.....A. T. Ramsdell  
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Endless belt press.....M. P. Fillingham  
Engine controlling mechanism.....G. S. Strong  
Engine for pneumatic drills.....H. J. Kimman  
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Fishing tackle spoon hook.....G. H. Bacon  
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Gate.....G. E. Champion  
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Governor.....A. L. Ide  
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Arranged beside the tracks, at the station, is a suitable platform and rails which are engaged by wheels placed at the top of the cab. As the train whizzes by, the cab is caught by this station arrangement and pulled from the moving car, whereupon the passengers (or what's left of them) can alight.

Those wishing to embark are treated in a directly opposite manner. Another cab is stationed beside the track and all persons wishing to board the train enter this cab, which in turn is caught up by the projecting platform of the moving car. The platform is then again rotated until the cab is in place and the people may take seats in the car.

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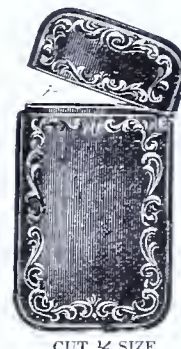
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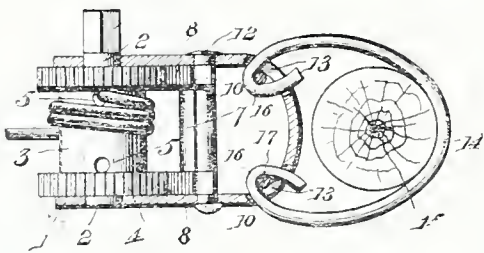
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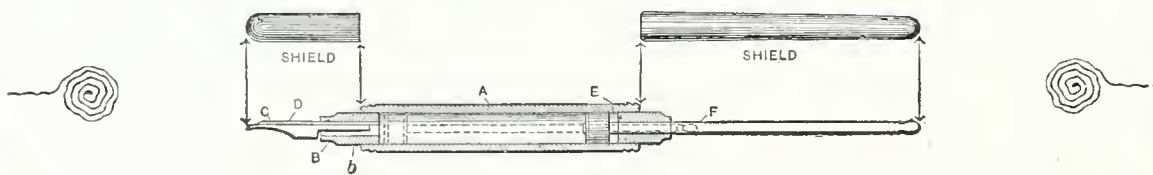
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## BUTTER MAKING.

### THE OLD WAY AND THE NEW.

**Wonderful Advance in the Last Half Century.—Due Almost Entirely to the American Inventor.**

The last half century has witnessed the revolutionizing of the dairy interests of the world, while the advent of the twentieth century will see it established on a basis strictly scientific in all respects, and strictly mechanical in all respects but one. The vastness of this change will be appreciated when it is stated that fifty years ago, milk, cheese, and butter were all produced crudely and laboriously and were handled and sold without skill or co-operation, while to-day perfected appliances, skillfully devised to lessen labor and accomplish perfect results, are provided all along the line. Further, condensed milk, milk sugar, several products for use in cooking, a glue, an enamel paint, buttons, combs, electric insulators and so on, are now produced from the skim milk which, until within very recent time, was thrown away. And all this is due to the inventors of America, who have devised all the important dairying tools now in use with the single exception of the centrifugal cream separator, and who will doubtless in time discover many more uses to which the waste material can be put.

The records of the Patent Office show the great attention that has been paid for years to dairying. For more than 70 years, a patent was issued for a new churn once every ten or twelve days and patents for other milking utensils were not far behind. In one respect alone, dairy labor is the same as a hundred years ago. Cows still have to be milked by hand. Although numerous attempts have been made, and patent after patent has been issued, no mechanical contrivance has yet been a practical success as a substitute for the human hand in milking. Therefore, twice a day, every day in the year, the dairy cows must be milked by manual labor. This is one of the main items of labor in dairying, as well as a most delicate and important duty. Allowing ten cows per hour to a milker, which means lively work,

it requires the continuous service of an army of 300,000 men, working ten or twelve hours a day throughout the year, to milk the cows kept in the United States.

Two great inventions stand conspicuously out among those which have brought dairying to its present state of perfection. The first of these concerns itself with the application of centrifugal force to the separation of cream from milk. It is based upon the fact that the specific gravity of milk serum, or skim milk, is greater than that of the fatty portion, or

cream. Hence, when subjected to centrifugal force, the milk is forced to the outer side of the separator, while the cream remains nearer the center, so that each can be drawn off through appropriate orifices. This centrifuge, or cream separator, enables the creaming or "skimming" to be done immediately after milking, preferably while the milk has its natural warmth. The cream can be churned at once, while sweet, though the better and more usual practice is to cool it thoroughly and then slowly cure or "ripen" it for the churning. The

cream can be held at a comparatively high temperature, avoiding the necessity of much ice or cold water. The skim milk is available for use while still warm, quite sweet, and in its best condition for feeding to young animals. This mechanical method is more efficient than the old gravity system, securing more perfect condition and preventing loss of fat in the skim milk. It also largely reduces the dairy labor. Separators are made of sizes and patterns suited to farm use, and to be operated by hand or other power.

The second great dairy invention of the period is the popular fat test for milk, which furnishes a quick and easy substitute for chemical analysis. This is one of the best benefactions of the experiment stations of the Agricultural Department. In several States these stations have done much creditable work in dairy investigation, and from them have come several clever methods for testing the fat contents of milk. The one which has been generally approved and adopted in this and other lands is named for its originator, Dr. S. M. Babcock, chemist and dairy investigator, first of the New York experiment station at Geneva and since of the Wisconsin experiment station. This test combines the principle of centrifugal force with simple chemical action. The machine on the Babcock plan has been made in a great variety of patterns, simple and inexpensive for home use and more elaborate and substantial for factories. By these machines from two to forty samples may be tested at once in a few moments, and by the use of bottles specially provided the percentage of fat may be determined in samples of milk, cream, skim milk, or buttermilk. Of course, the glassware appurtenances of these testers must be mathematically accurate.

This fat test of milk has wide application, and it may fairly be questioned whether it is second to the cream separator in advancing the economics of dairying. The percentage of fat being accepted as the measure of value for milk for nearly all purposes, the Babcock test may be the basis for municipal milk inspection, for fixing the price of milk delivered to city dealers, to cheese factories, creameries and condenseries, and for commercial settlements between patrons



BUTTER MAKING THE OLD WAY.



BUTTER MAKING THE NEW WAY.



in co-operative dairying of any kind. By this test also the dairy farmer may prove the quality of milk from his different cows and (with quantity of milk yield recorded) may fix their respective value as dairy animals. Cows are now frequently bought and sold upon the basis of the milk scale and the Babcock test. With perfect apparatus in competent hands the accuracy of the test is beyond question, and it is of the highest scientific value and practical use. It should be noted that although clearly patentable, thus offering to the patentee an independent income through a very small royalty, this priceless invention and boon to dairying was freely given to the public by Dr. Babcock.

As a result of all these improvements, the supplying of milk to great cities has been reduced to a system and the making of butter and cheese has been placed on a scientific basis. Cheese making especially has been transferred bodily from the realm of domestic arts to that of manufactures. Farm-made cheeses are now hard to find anywhere; they are used only locally, and make no impression upon the markets. In the middle of the century about 100,000,000 pounds of cheese was made in the United States, nearly all of it in farm dairies. At the close of the century the annual production of the country is about 200,000,000 pounds, and ninety-six or ninety-seven per cent of this is made in factories.

In butter the influence of the factory is not so marked. Great as the growth of the associated system of butter making has been and fast as creameries have multiplied, especially in the newer and growing agricultural States, there is still much more butter made on farms in the United States than in creameries. Creamery butter controls all the large markets, the dairy products making comparatively little impression on the trade of these; but home consumption and the supply of small customers and local markets form an immense aggregate, fully two-thirds of the total supply. Estimating the annual butter product of the country at 1,400,000,000 pounds, not much over 400,000,000 of this is made in the 7,500 or 8,000 creameries now in operation.

However, the average quality of butter in America has materially improved since the introduction of the creamery system and the use of modern appliances, and the improvement steadily continues. Nevertheless, a vast quantity of poor butter is made—enough to make a large and profitable business in collecting it at country stores, at grease prices or a little better, and rendering or renovating it by patent processes. This renovated butter has been fraudulently sold to a considerable extent as the true creamery article, of which it is a fair imitation while fresh, and several States have recently made laws to identify the product and prevent buyers from being deceived. No butter is imported into this country, and the quantity exported is as yet insignificant, although a foreign demand is beginning to appear.

Thanks are due to the Agricultural Department for the illustrations and much of the information contained in the foregoing article.

## COTTON INVENTIONS.

### New Way of Compressing Bales.

All Chances of Fire Prevented and Money Saved in Other Ways.  
Artificial Silk and Cotton. New Gin Cleaner.

The terrible fire at Hoboken, which originated in the inflammable cotton bales stored on the wharves, will, in all probability, mark the final victory of the new cylindrical bale over the old and wasteful square bale. In addition to its many other advantages, the new style of bale is so dense that it will not take fire, and though the surface of it may be ignited, it quickly goes out of its own accord. Thus the material, when stored on shipboard, is in no danger of ignition by spontaneous combustion or otherwise, and the necessity for carrying large insurance upon it is done away with.

The cotton crop of this country last year was 9,500,000 bales valued at \$350,000,000, and the loss by waste incidental to the process of taking samples was not less than \$7,000,000. The new kind of bale has a sample attached to it on the outside, and is guaranteed to be of the same quality throughout. Nobody is allowed to hack it with knives and extract portions of its contents, as has been customary with bales of the old type.

The old style plantation bale, in which the bulk of the cotton crop of the United States is still put up, has a density of about twelve pounds to the cubic foot. It is carried from the plantation to the nearest town where there is a power compress—a steam apparatus of 300 horse-power or thereabouts, costing \$40,000 to \$60,000—and is reduced one-half in bulk for weight. In this shape, done up in bagging, it goes to market, usually arriving at its destination with its sacking torn to pieces, the iron strips that hold it together mostly removed, and the contents dirty and more or less saturated with oil and other impurities.

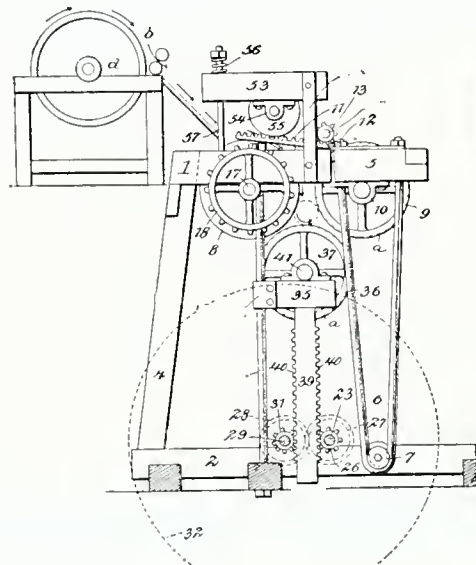
On the other hand, the new kind of bale, containing the same weight of cotton in a package greatly reduced in size, reaches the market in perfect condition. It is cylindrical and of moderate dimensions, is easily handled, and its contents are neither wasted nor dirtied. There are several patented processes for making these bales, one of them consisting in winding the cotton under great pressure in a continuous layer around a stick. It has been found practicable to produce a density of eighty-six pounds to the cubic foot, but half that is considered sufficient.

Another advantage of the new-style bale is that it can be put up in its final market shape on the plantation, the machinery required being comparatively simple and inexpensive. Its final wrapping is of burlap. Consular reports received from Europe contain many references to the new methods of baling.

Dealers over there are highly pleased with the change. They say that the old square bale caused great waste of cotton, was hard to handle and gave opportunity for fraud, stones or other heavy foreign substances being some-

times found in the heart of a bale, evidently put there to increase its weight. By the new methods of baling, the machinery employed rejects all foreign substances, and not only is the item of waste eliminated, but the possibility of fraud is reduced to a minimum.

**NEW COMPRESS:**—These facts lend special interest to a new roller compress, patented by E. D. Carter, of Brenham, Texas, which forms cylindrical bales from cottonbat by winding it in successive layers on a compressing roll.



The illustration shows a side elevation of the compress, ready to begin the formation of a bale. The compressing roll, 9, is journaled in bearings on the underside of the beams, 5, which, in turn, are supported by rocking standards, 6, which are pivotally supported at 7. As the bale grows, the entire compress roll with its supporting beams and rocking standards, slowly turns on the pivot 7 away from the rest of the machine, thus allowing room for the growing bale. This lateral movement is governed by the rack, 11, and pinion 13. At the same time, by means of a sprocket chain (not shown, being on the other side of the machine) into which a pinion corresponding to 13 works, compressing roll 36 is made to descend at exactly the right speed to enable the compressing rolls 36 and 8 to maintain a firm pressure on the growing bale. This chain is kept taut by means of a rack bar and pinion set on a rocking standard on the opposite side of the machine.

In practice, two compresses are employed side by side and so operated that one of them completes a bale at the moment that the other begins the formation of one, so that the operating-hands may be employed in the bagging and delivery of the completed bale while the other bale is in process of formation. This is an exceedingly economical arrangement and enables two compresses to be operated by the same number of hands that would otherwise be required to operate one of them.

**MERCERIZING:**—Scarcely a month passes without the introduction of some valuable improvement for "lustering" cottons so as to make them resemble silks. This lustering is known as "Mercerizing," from the name of its inventor. Its general principles were described in a recent issue of the AGE, but the details of the processes by

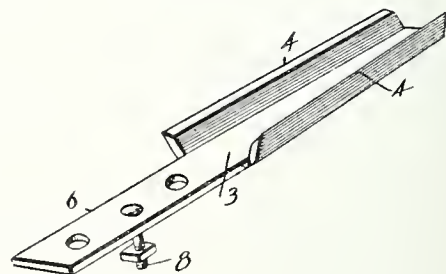
which it is accomplished are infinite.

As a result of the process, the goods are modified in three ways. They acquire a silky look, they become very much stronger, so as to better resist tearing, and take dyes more readily and satisfactorily, this last point being due to the affinity that exists between the caustic alkali used in the process, and the coloring substances. Under the circumstances, it is not surprising that this imitation of silk should have found great favor in the market, its employment for linings being especially widespread, inasmuch as the fashion of the day demands silk linings, or what appear to be such, even for the simplest cloth gowns. There is still an abundant field for invention in this line.

**ARTIFICIAL COTTON:**—Consul Mahin, of Reichenberg, sends to the Department of State, a flat denial of recent widespread stories anent the manufacture of "artificial cotton," the process for manufacturing which was described in the July AGE. Consul Mahin, authorized by a distinguished chemist, says:

"In the absence of more definite information, I am inclined to believe that these rumors sometimes have their origin in an obvious attempt to deceive, but that they more commonly arise from mistaken or unauthorized reports of the work of Mitscherlich in Germany in spinning the unchanged spruce and fir fibers, or that of Chardonnet and of Leluyer in the production of artificial silk. This last material, of course, is well known in Europe and has been made the subject of several consular reports." The description in the AGE referred to the spinning of spruce fibres in Germany, which produced a substance closely resembling genuine cotton. It is, of course, the privilege of Consul Mahin to call this by some other name, but the world in general has christened it as "artificial cotton."

**COTTON GIN SAW CLEANER:** Another ingenious cotton invention is a knife for cleaning the saws used in the ordinary cotton gin. The illus-



tration shows a perspective of one of these knives. As many as may be desired are secured at proper intervals to a bar. Each is preferably made of malleable iron, and has cutting edges, 4, 4, which taper towards each other at the end of the knife. When placed between the parallel saws of the gin in the usual manner, and the gin is reversed, the cutting edges cut or scrape the adhering cotton from the saws, entirely cleaning them. This ingenious device was patented by T. H. Nance, Talladega, Alabama



## A TRIP TO THE MOON.

Unique Side Show at Buffalo Fair.

"Topsy Turvy House" at Paris.  
It Pays to Invent Novelties  
to Amuse the Public.

It is not only inventors with deep serious casts of countenance and big bulgy brains that "scoop the shekels" nowadays. The world insists on being amused as well as clothed and fed, and the man who can devise a new means of accomplishing this can soon retire and live on his income. Among such inventors may be classed the man who devised the alleged air ship, which is to form one of the attractions of the Midway at the Buffalo Exposition, and in which the fortunate traveler may enjoy a trip to the moon.

The voyager goes aboard the air-ship "Luna," moored at a convenient landing. It is night, and the heavens sparkle with a myriad of stars. When all is ready the cables are thrown off and the ship rises steadily to a height of about two miles. The air is clear, and the many lights of earth can be seen below. The ship passes eastward over Rochester, Albany, and then southward over New York. The earth falls rapidly behind. The ship is going at a terrific velocity, as noted by the resistance of the air, which blows hard in the faces of the passengers. The earth becomes a large ball and the moon grows larger. The moon is fast being neared, and soon the ship is moored to a landing on that orb. Guides receive the visitors and show them to the palace of the Man in the Moon. His Majesty receives the party, bidding them welcome and accords them the freedom of his domains. They are then shown about the splendid palace and through the streets of the City of the Moon. The ladies are especially interested in the show windows of the Moon shops. The trip may be made with entire safety, and the return to earth leaves one with

the remembrance of having passed through a wonderful experience.

### TOPSY TURVY HOUSE.

It is a long jump from Buffalo to Paris; not of course, so far as it is from Buffalo to the Moon and return, but still a good step. But Paris, like the American city, has a Midway, though it doesn't call it by that name, and some of its shows are unique.

you, mirrors behind you, above you, and on every side in fact, there are mirrors wherever you may chance to be looking.

The chief difficulty in constructing the building lay in obtaining sufficiently large mirrors. Eight of the leading glass manufacturers of France absolutely refused to entertain the making, and above all the fitting to

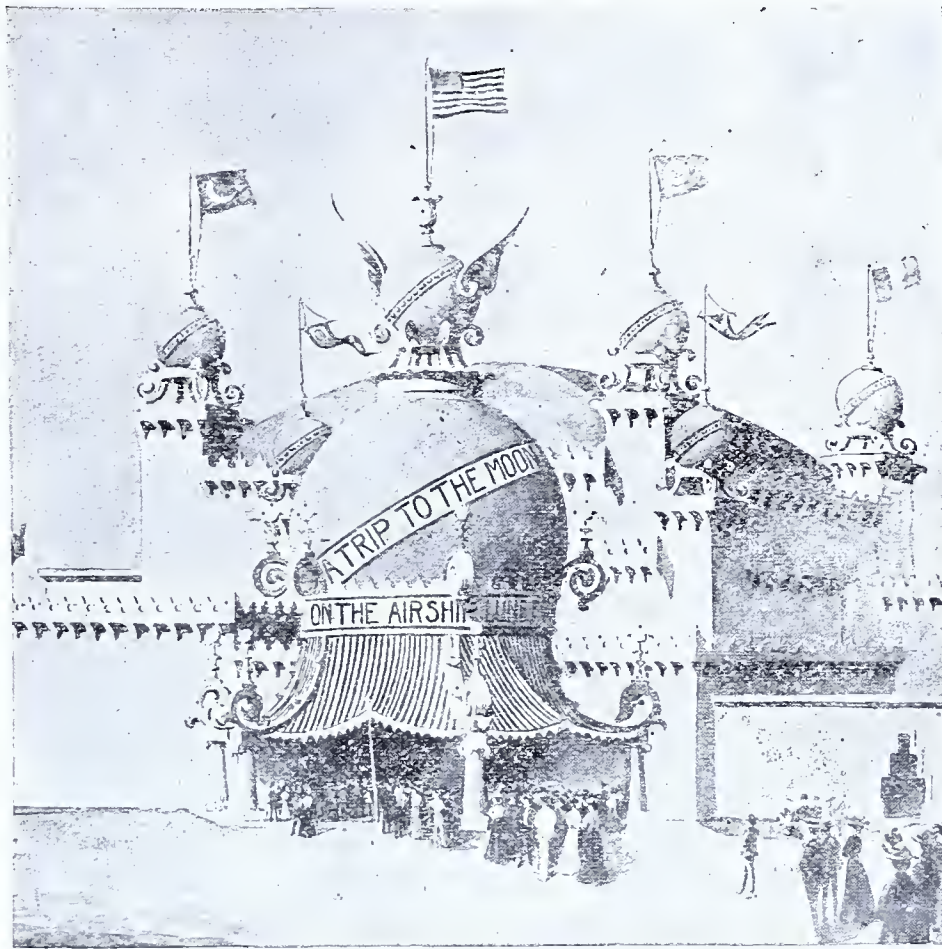
possible to place the mirrors, some of which are about 12 feet square, on the ceilings, as desired, without some support, which in this case consists of a glass pillar which supports each mirror in the centre.

The "roof" of the building, is about 7 feet from the ground, nearly touching the hat of a tall man as he passes underneath. The tiles remind you of their presence, though you do your best to avoid them, and you enter by means of the chimney, the smoke of which comes out face downwards; whilst the drain-pipes possesses exits far above the trees which line the avenue.

The chimneys and buttresses of this mediæval castle (which ancient structure the building is supposed to represent) support it, and the cellar, with its wine and spirit bottles all upside down, is to be found about 50 feet above ground-level.

At the so-called entrance-door you will observe that the clock and the lettering are upside down, and as you enter you will find yourself walking up the steps with your feet upwards and your head at a perilous angle; while farther on you will find a lady in a drawing-room knitting very prettily on a sofa which looks as though it were suspended upside down by a thread to the ceiling above. Soon your head will swim in bewilderment, and quite naturally you make your way to the bath-room, where the water flows upwards into an upside-down bath-tub, in defiance of all the laws of gravity. Further still, a gentleman will be found trying to swallow his food feet upwards in the dining-room, and how the dainty mistress of Topsy-Turvydom fares in her boudoir is a problem the solution of which must be left to the visitor. The inventor of the structure is Mr. Adolphe Kotin, a Russian.

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Probably the most curious is the extraordinary structure known as "Le Manoir a l'Envers," or "Upside Down House." The house is literally built upside down, with its roof at the bottom and its basement at the top.

On the outside, this is accomplished in the actual construction of the building, but inside the effect is produced by means of mirrors. There are mirrors upon mirrors; mirrors before

the ceilings of such huge mirrors were demanded. At last, however, an enterprising firm took up the matter, and the inventor says that the mirrors which are placed on the ceilings of the various rooms are without exception the largest of their kind in the world. Their manufacture and fitting in position cost no less than \$7,500.

It appears that glass, however thick, is so flexible that it proved im-

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## RAILROADS IN GERMANY.

**MOST OF THEM ARE OWNED BY THE STATE.**

**Controlled by Laws Widely Different  
From Those in the United States.  
Parts of the Military Machine.**

So intimately has the railroad entered into the life of the world that it is almost impossible to realize that it has grown up from nothing in the last three quarters of a century; that is to say, within the memory of many men now living. Yet such is the case. In 1825, there was not a single mile of railway in existence; to-day the latest statistics show 422,100 miles. The construction of this enormous mileage has revolutionized every line of trade in the world, and by the diffusion of knowledge that followed in its wake, has changed the minds of people and the fate of nations.

The first railroad was built in England, and the second in the United States, but other countries followed so rapidly that it may fairly be said that the new system was established simultaneously in all the civilized parts of the globe. In each section the essentials were the same, a hard roadbed with rails on which some sort of cars were propelled by steam—but in nearly every other detail the systems differed in proportion to the differing habits and customs of the States where they were constructed.

In no particular did the railroads of the various States differ more markedly than in their relations to the law and the State. In some countries, notably the United States, they were regarded just as all other roads were, and were held to be subject to general principles of law. In others, notable Prussia, they were held to be entirely separate and apart from all other forms of business, and special codes in regard to them were devised from the very first. From this initial difference, two widely dissimilar systems have grown up.

The American system—or until the last few years, lack of system—has given the United States three-sevenths of all the railway mileage in the world. It has given it comfort, even luxury, in travel, cheapness both in passenger and freight transportation, and speed on long runs exceeding any other trains in the world. On the other



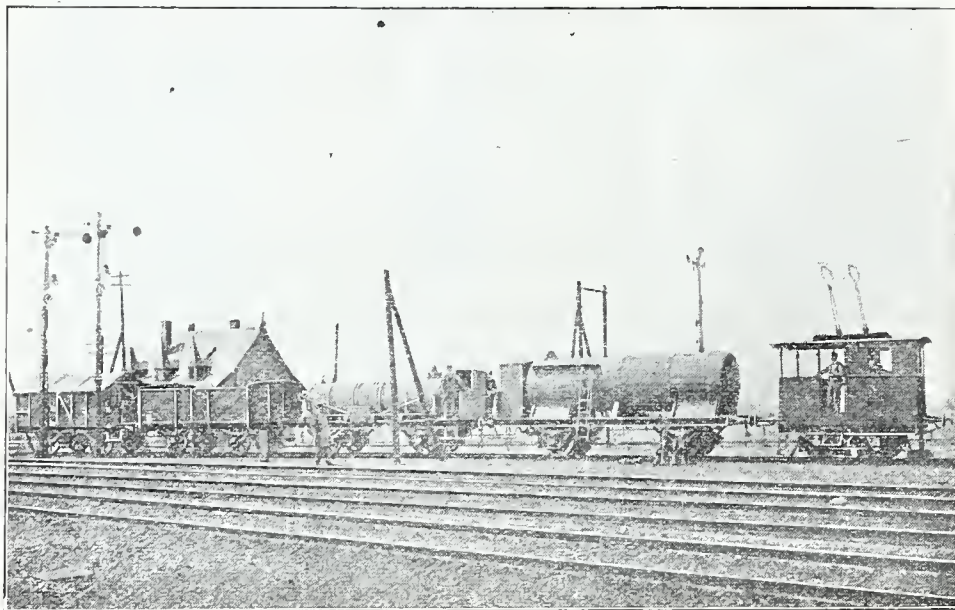
OLD STEAM STREET RAILROAD.

hand, it has given this country speculation, costly rate wars, deliberate robbery both of individuals and of the Government: it has put the roads "into politics," and made them almost unavoidably guilty of bribing or attempting to bribe legislatures; and it has enabled them to show favoritism to

certain shippers (like the Standard Oil, for instance) which has resulted in the creation of enormous fortunes and crushing monopolies.

The German law of to-day is practically the Prussian law of sixty years ago. It has given that country a railroad system so incomplete as to sadly hamper trade; it has given high rates, if any sort of comfort is to be had, and it has made the commercial administration of the roads subordinate to their availability for military purposes. On the other hand, it has caused scrupulous honesty and fair dealing between man and man, and has avoided practically all the ills incurred in the United States.

In 1899, Germany had 31,150 miles of railroad owned by the government, and 2,945 miles owned by private parties. These railways, whether state or private, are classified as



ELECTRICAL COKE RAILROAD IN GERMANY.

primary, secondary, local, private branches, and isolated private roads. Primary roads correspond to our trunk lines. They have faster trains and more of them, and more brakes to the axle than the secondary roads, and are subject to different regulations as to their operation, as to the mails and as to their rates. Both primary and secondary roads, however, are considered by German law as things apart from general commerce, governed by a special code found for them alone. Local and private roads, on the other hand, are subject only to general commercial law and are not considered "railroads" at all. If, however, a local road should so grow in importance as to become part of the "general network" of railroads, the state may buy it and add it to the general system.

Companies seeking charters to build railroads must first furnish proof of the value of the road; show that the territory traversed can support it, and give reasons for the choice of route, and give proof that it has the necessary money to build, equip and operate the line. Also, the line must be permissible from a military point of view. In the case of a proposed government road, a similar state of affairs is required.

It is scarcely necessary to point out how this practice differs from that of the United States. Germans do not, and are not allowed, to build and operate roads at a loss in order to develop a certain part of the country, as is so often done in the United States. Probably nine-tenths of the wes-

tern railroads of the United States would have been refused permission to build at all under German administration.

Rates on German roads are practically fixed by the government. For three years on primary and eight years on secondary roads, the owners have a partial right to fix rates; after then the State has the right to alter the existing rates, veto any proposed change of rate, and even to establish rates.

Freight is uniformly classified as follows: (1.) Fast freight by the piece; (2.) Fast freight by the carload; (3.) Piece goods; (4.) General articles, Class A1, in shipments of not less than 5,000 kilograms (10,000 pounds); (5.) General articles, Class B, in shipments of not less than 10,000 kilos; (6.) Special tariff, A2; (7.) Special tariff I, manufactured goods;

(8.) Special tariff II, intermediate goods; (9.) Special tariff III, raw materials. These classes are arranged in the order of cost, the first paying the highest charges. Specials I and II are classed as Special A2, and Special III is classed Special II, when shipped in lots of less than 10,000 kilos.

Generally speaking, the rates are high. In the United States, on an average, it costs .8 cents per mile to move a ton of freight. No such general average is at hand in regard to Germany, but individual rates show the difference. The charge, for instance, for carrying a ton of wheat 300 miles is \$5.60, of iron or coal, \$2.90; that is to say, 1.9 cents per mile for the wheat and .97 cents for the coal. About 287,000,000 tons of freight are carried by German railroads every year, and nearly 700,000,000 passengers. The expenditures per year are estimated at \$228,000,000, and the receipts at over \$400,000,000.

First-class passenger rates are as high as those in the United States and the accommodations are not nearly so good. They vary from a little over 3 cents per mile for first class, to 2½ cents for second, 1½ cents for third, and about .8 cents for fourth, for slow trains. For fast trains, the rate is about a fifth of a cent more per mile. There are also commutation and school tickets at even lower rates, and soldiers are carried for nothing on government roads. Very few people travel first-class; on the other hand, the fourth is impossible except for those who cannot afford comfort, the

vehicles resembling ordinary freight cars in the United States, without springs or seats. Very little baggage is allowed.

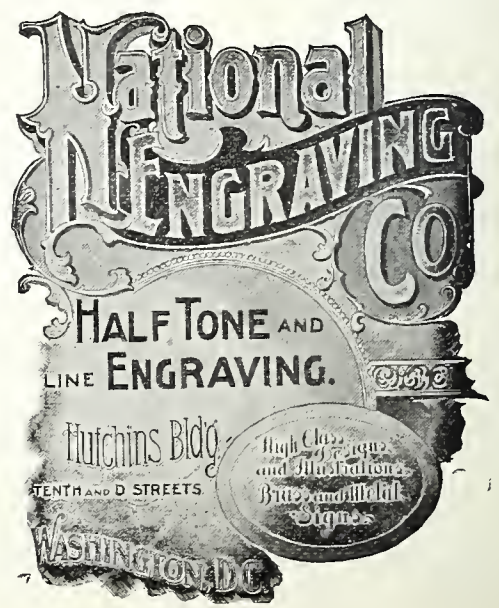
There is a very general misapprehension in regard to the safety of travel on German railroads. Most Americans think that accidents are few and far between, and this is true so far as passengers are concerned.

But in regard to the "butchers bill" of employees, Germany has a far worse record than the United States, the percentage of killed being about one out of every 400, while in Great Britain, it is one out of 300 and in the United States it is only one out of 600. United States roads nearly all now have safety appliances, couplers and the like, being so required by law, while neither Germany nor Great Britain has them.

A point of interest for Americans is the fact that American locomotives are being widely copied in Germany, and officials there are considering the advisability of adopting the American system of brakes. It should be mentioned here that inventors of railway appliances make a great mistake if they fail to patent these in Germany, as no country is quicker to recognize the advantage of new (especially American) devices, and to copy them. American manufacturers do not hesitate to admit to their mills German mechanics visiting the United States—many of whom are sent for that very purpose. Many German experts can draw from memory an almost perfect picture of a machine, even if complicated, after examining it from five minutes to half an hour. American manufacturers also send drawings and catalogues to machine makers in Germany, and the result is that not a few factories there are full of copies of American apparatus.

Another practice is to ask for sample machines, which are taken to pieces and successfully imitated. This is now being done with American locomotives. The Bavarian railway administration advertises that it has bought some Baldwin engines for the sole purpose of enabling Germans to study the details of construction in which they differ from home manufacturers—especially in respect to the boilers, cylinders, and frames, dimension of axles, valves, and gears, couplings and buffers, and invites engineers to familiarize themselves with these points, the object being to use them as patterns. The only way to prevent such wholesale robbery of the products of American invention is to promptly patent devices abroad.

Electric railways are spreading rapidly in Germany, there being now over 1,200 miles and construction having begun but nine years ago.





## NEW JOB WEB PRESS.

Invented by John E. Caps, of Kansas City.

Prints Wrapping Paper in Different Catchy Colors and Designs at the Rate of Five Thousand Yards an Hour.

The development of appliances pertaining to the printing press has not been exceeded in any other branch of industry. The change from the ancient wedge press to the hand lever press was considered to be a great improvement, but the difference between the hand press and the latest productions of modern manufacturers is much greater. As the outgrowth of the original hand press, we now have great steam-power presses, some of which are capable of delivering 20,000 impressions an hour.

The web perfecting press prints from a continuous roll of paper, and impressions are printed on both sides of the sheet, alternately, from curved stereotype plates fastened to the cylinders. The same machine also cuts off the sheets in proper length, folds and pastes them, and delivers a complete newspaper with such rapidity that the editions of the great dailies are now printed in a few hours.

While the facilities for printing newspapers have been greatly improved in the past few years, the field in job printing has not been overlooked, one of the most important recent productions in this branch of the printing business, being the Caps patent web press, invented by John E. Caps, of Kansas City, Mo.

The Caps press finds one of its principal uses in printing fancy wrapping paper. In its most elaborate form, it makes three consecutive, though almost coincident, impressions on the

who see in the catchy designs and bright colors, a means of attracting attention to their wares and to themselves.

Another use to which the Caps press is especially adapted is the printing of street car tickets and transfers, theatre tickets, railway tickets, and so on, which bear consecutive numbers and



are printed in varying colors so as to prevent confusion between different days. Few people without special knowledge know how these are printed, but it is by some such means as that furnished so well by the Caps press, the dates and numbers being printed in color first and the rest of the ticket an instant later. The press also cuts the tickets apart. They are produced at the rate of 7,000 an hour, much faster than by the old method, by which it was necessary to run the tickets through a job press twice and cut them apart afterwards. The Caps press occupies but little more space than the ordi-

As a jeweler, he became quite an expert at engraving and printers often called on him to make cuts for them, and in this way, he first became interested in the printing business.

He was for years a member of the firm of Carlton, Caps & Co., of Fostoria, Ohio, but after the failure of ex-Governor Foster, the business was sold to the Brass and Iron Works, of Fostoria, and Mr. Caps became interested with his brothers in his present business. The Caps brothers are enterprising and always on the watch to supply wants in their line of business. Besides manufacturing the Caps patent job web press, they manufacture complete modern stereotyping outfits, photo-engraving machinery, and so forth. All the principal firms in Kansas City, which use the class of goods manufactured by Caps Bros., patronize them, and some of their productions can be found in use in nearly every part of the United States, Canada, and Mexico.

According to Mr. Caps, much of his success in getting broad claims allowed on his patents, thus making them profitable, has been due to the skill of his attorney, Mr. E. G. Siggers, of Washington, D. C. In a recent letter to Mr. Siggers, Mr. Caps says: "I would like to say for the benefit of others desiring patents, that my experience with patent attorneys has been varied, and that it gives me a great deal of pleasure to say that you understand a mechanical device quicker from its description than any person I have ever come in contact with. Reduced to plain facts, this means that you have secured for me all the claims I have made to either improvements on machinery or inventions. At any time when opportunity presents itself, I shall do what I can to send you new business."



Advertisements inserted in this column for 20 cents a line (about 7 words) each insertion. Every new subscriber sending \$1.00 to THE INVENTIVE AGE will be entitled to the AGE one year and to five lines three times FREE. Additional lines or insertions at regular rates.

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FOR SALE.—Patent No. 653,069, Cigar Box Lid and Price Card Holder, adjustable to any angle, and fits cigar box of any size. Every cigar stand in the United States requires them; also used as souvenirs by manufacturers. Address Joseph M. Appel, 18 State street, Rochester, N. Y.

FOR SALE.—Patents 620,950 and 643,332. Corrugated Metal Fence Post and Spring Cable Wire Fence. Will sell outright, license under royalty or state rights. Address L. S. Morgan, Kendall, Kans.

PATENT No. 651,240, plow and pulverizer combined; will do one-third more work with less draft than any plow ever patented. It is the future breaking plow of the Twentieth Century. For particulars address, John I. De Witt, Bluffton, Wells Co., Indiana.

FOR SALE.—Patent 650,321, dated May 22, 1900. Stove pipe fastener. The only device made that will securely hold pipe in the chimney. Address G. A. Higgins, Galesburg, Ill.

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PATENT No. 32,596. Wall Desk. Will sell exclusive right at a bargain. This is a valuable patent. Can be easily made and will be a good seller. Correspondence invited. C. E. Gardner, Box 76, Bakersville, Pa.

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FOR SALE.—Patent No. 646,026, dated March 27, 1900. Bill of fare indicator. Address F. A. Hertzner, Jacobsville, Mich.

FOR SALE.—Patents No. 654,723 issued July 31, 1900. A door check and lock. Door can be left slightly ajar, yet securely locked; cannot be unlocked from outside. Can be used in connection with night or other lock; furnishes absolute protection from burglars and tramps, also prevents annoyance from canvassers and peddlers. Ornamental as well as useful. Ready seller, as any lady will recognize on sight the protection it will afford; should sell at every house; cheap to manufacture; desire to sell patent outright; good thing for lock or novelty manufacturers. No sale agencies, brokers, &c., need apply. Address, if you mean business, F. A. Smith, Ins. Agt., Galion, Crawford Co., Ohio.

FOR SALE.—Patent No. 654,267. Latest device in travelers' telescopes. All travelers want them. Address A. Mieden, Seattle, Wash.

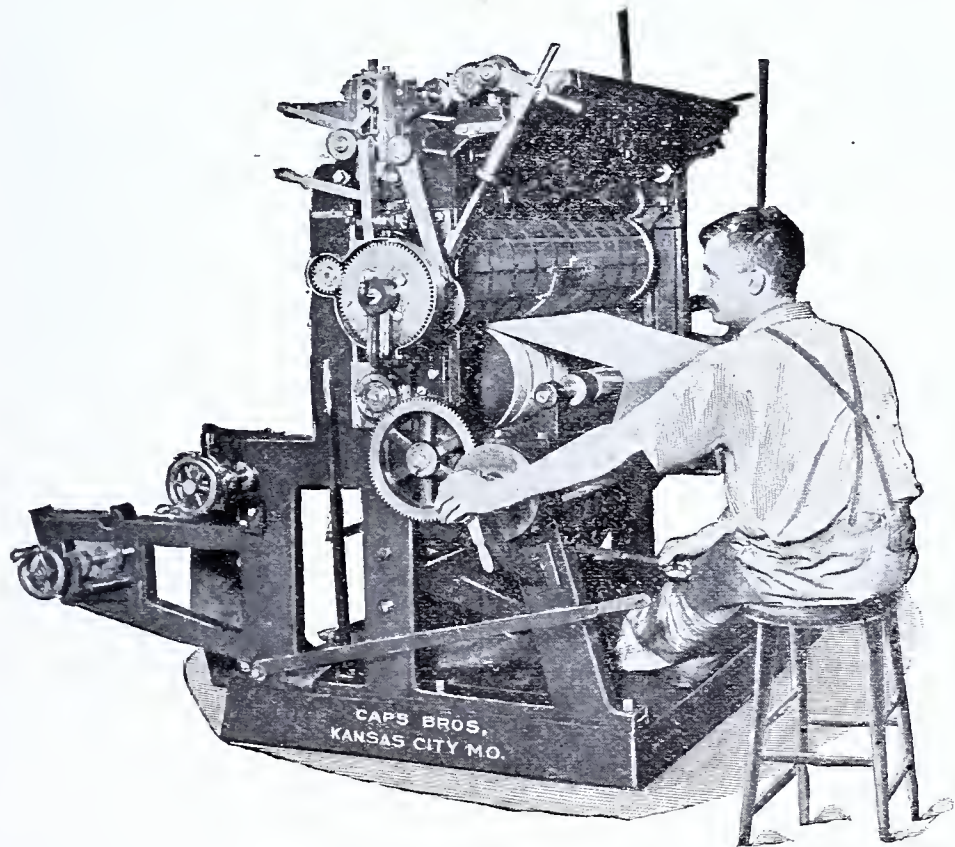
## WANTED.

WANTED.—Good man in every city in the United States and Canada to sell the Owen Safety Window chair, light, safe, and adjustable to any ordinary window. For particulars write D. E. Owen, Burton, Ohio.

WANTED.—People all over the United States to use my system of Sub-Irrigation. Try and be convinced. Write for circular. W. A. Lee, Peoria, Ill.

WANTED.—To secure patents for wrought steel joist and wall hanger and stirrups; also wrought or cast post caps and heel plates; or any other specialty of the building trade. Address P. O. Box 445, Pittsburgh, Pa.

INVENTORS AND MANUFACTURERS. We design and build all sizes and kinds of machinery to order, develop ideas, perfect inventions; anything you want. Address: The R. G. CLYNE Machine Works, Walpole, Mass.



paper, the first of a design, such as polka dots, stars, brownies, and so on; the second, of stripes, either broad or narrow or in groups, and of as many different colors as may be desired; the third, in ordinary printing ink, of an advertisement for the merchant who is to use it. All this is done by a single passing of the paper web through the press, at the rate of 5,000 yards an hour.

Wrapping paper, such as is produced by this press, is rapidly growing in favor amongst wide awake merchants,

nary plate job press, and can be operated with almost the same power.

Mr. Caps, the inventor of this press, is quite a genius. Besides the press, he has invented a number of machines used in stereotyping and preparing plates for printing, and so on. He was born on a farm near Bluffton, Ind., May 28th, 1858. At the age of 14, he left home to live with an uncle in Pittsburgh, Pa., where he learned the jewelers' trade, returning home and going into the jewelers' business at Fort Wayne, Ind., several years later.

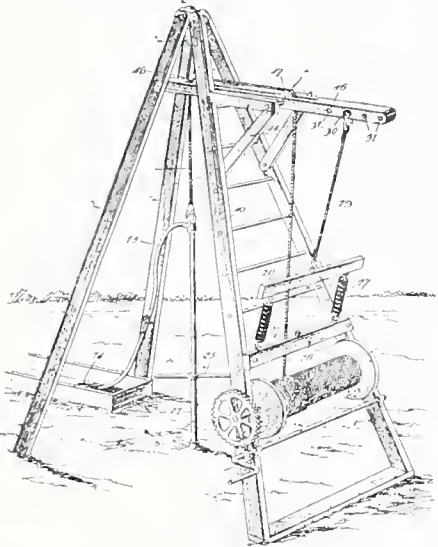


## CLEVER NEW PATENTS.

### Ingenious Devices Intended to Supply Long Felt Wants—Well Drilling Machine, Saw Buck, Hame Hook and Many Others.

#### Hand Well Drilling Machine.

In working with a hand drill of any kind, whether it be an elaborate one or simply a pointed bar, a great deal more than half the strength of the worker is expended in withdrawing the drill after striking down with it. As everyone knows, this is because it is far easier to strike down than it is to pull up. Hence, numerous devices have been contrived to extricate the tool from the grip in which it is usually held at the bottom of the drill hole, and raise it ready for another stroke. The most ingenious method for doing this that has been patented for a long time, is the invention of G. D. Loomis, of Tiffin, Ohio, illustrated below. The derrick in the figure has supported on it by means of brackets, 14, 14, a rocking lever, 16, free to move to a certain extent at both ends. Pulleys are fixed at 17 and 18, over which runs a rope connected at one end with an ordinary

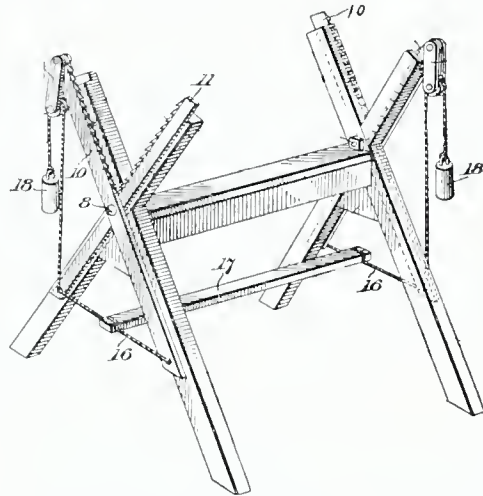


drum and crank, and at the other end with the drilling tool. The outer end of the rocking lever, 16, is attached to a rope, 29, which extends down to a bar, 28, which is again attached to a lower bar, 26, by two or more strong springs, 27, 27. The rope may be attached to the rocking lever at various points, 30, 31, etc., thus increasing or decreasing the amount of leverage. Now when the workman grasps the cross handle, 25, and thrusts the bar down into the ground, the rocking lever is tilted, one arm down and the other up, thus stretching the springs. When he lets go, the springs contract strongly and jerk the tool up, ready for another stroke. A little more power is required, of course, to drive the tool down against the strength of the springs, but it is so much easier to apply it in this direction that the work is not half so fatiguing as if the workman also had to exert himself to withdraw the drill. The pipe, 23, shown in the cut, supplies the slush to drill in the usual way.

#### Sawbuck.

One of the most welcome labor saving devices possible has been invented by A. G. Clark, of Fort Recovery, Ohio, upon whose name future generations of wood sawyers will doubtless call down blessings. They will

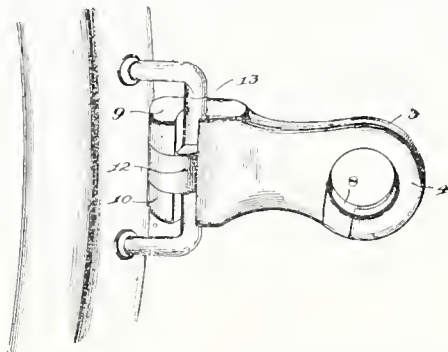
certainly do so, if they realize how great is the labor from which his improved sawbuck has rescued them. The illustration shows clearly the construction of the new device. Primarily, it is like an ordinary sawbuck, but has also certain clamps which hold the wood firmly in place and enable the workman to stand almost upright, thus freeing him from the



arduous labor of continually bending over his task. The clamps consist of a pair of levers, 10 and 11, pivoted together at 8 and set with teeth. Their lower ends are connected by ropes, 16, 16, which can be depressed by a slat, 17, fixed near the ground. When this is pressed down by the foot of the workman, the levers close together like the arms of a pair of scissors and the teeth grip and hold the log to be sawed. When the foot is removed, the weights, 18, 18, pull the levers apart, withdraw the teeth and release the log.

#### Hame Hook.

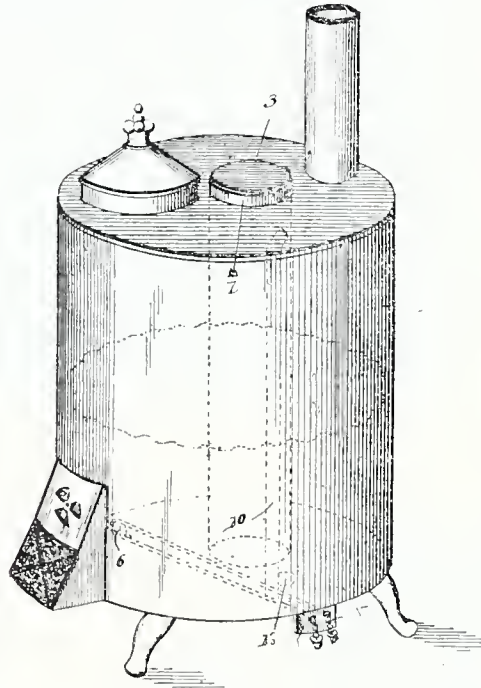
Every one who has split his finger nails and scratched his hands in trying to fasten or loosen the hard buckles of harness, or slip in and out stiff traces, knows only too well that there is much to be desired in the present methods of securing these. Edward Hlunhoff, of Waxahachie, Texas, who has probably suffered from this cause himself, has invented a new hame hook which will avoid this discomfort in at least some of the parts of the harness. The illustration below shows the hook when closed. It consists of two parts, 3 and 4, each of which, when separate,



forms only a hook and not a solid ring. The lug marked 8, for instance, belongs to the under part, 3, and when the device is closed fills in a gap in the upper part 4. On the other hand, a somewhat similar lug on the upper part, 4, fills a somewhat similar gap in the lower part, 3, at about the spot marked 3. All the gaps are filled flush with the contiguous surfaces. Both parts of the complete hook are pivoted at 13, where, by means of an ingenious device, they can readily be attached to, or removed from the hame, and when closed, are in no danger of coming apart.

#### Stove.

Strange as it may seem, there is room for improvement even in the ordinary stove, an article which has been in use practically ever since man became sufficiently civilized to live in a heated house, and which has been continually improved for thousands of years. C. H. Seaman, of St Joseph, Mo., has recently secured a patent on a really novel device, which not only enables a stove to act as provider of hot air in much the same way as the ordinary furnace, but which also supplies means almost entirely lacking in the usual form of stove, whereby the room can be ventilated and the foul air which lies along the floor can be drawn off and sent up the chimney. The illustration shows the stove, which externally is much like the ordinary one, the essential difference being in the drum, 10, which runs vertically through it from top to bottom. This is closed at the top by a movable lid, 3, and at the bottom by a pivoted damper. When both ends are open, cold air along the floor is drawn up through the drum, heated and sent out into the room. This fulfills the

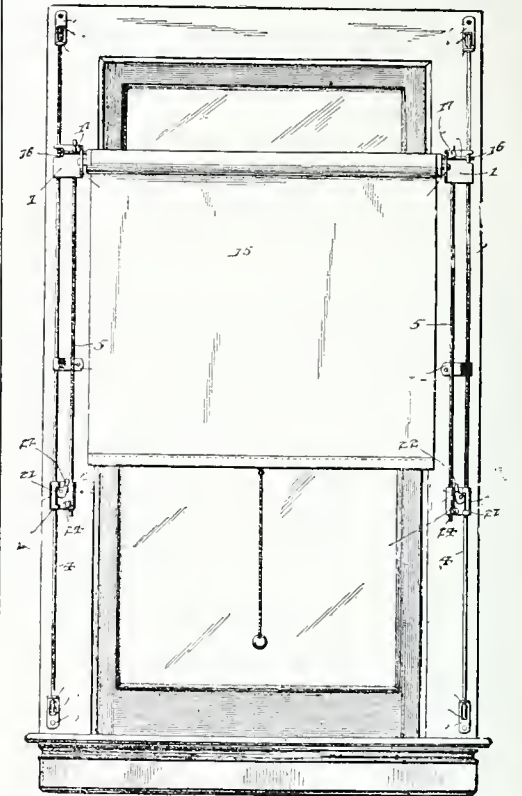


first object of the invention. For the second object, a tube, also open near the bottom, but reaching nearer to the floor, runs up through the drum and opens through its side into the main body of the stove just below the stove pipe. Through this the foul air, carbonic oxide gas, etc., which lies close to the floor by reason of its greater weight, is drawn up by force of the draft in the chimney and carried out of the house.

#### Curtain Fixtures.

Ordinary window blind fixtures are nailed to the window casing at the extreme top and remain there always, thus holding the screen fixed and interfering with efficient ventilation at the top of the window, where, of course, it is most needed in order to draw off the heated air that has risen to the ceiling. C. C. Thompson, of San Antonio, Tex., has invented a device whereby the blind is attached, not to the window itself but to small rods extending vertically along its sides. The attachment is so made that the blind fixtures and all, will slide up and down on these rods, thus enabling it to be kept at the top ordinarily, as in the case of the ordinary

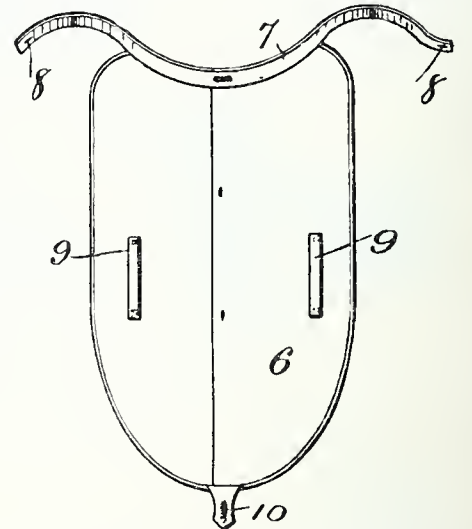
blind, and yet to be lowered with ease when full ventilation is desired at the top of the window. The construction



will be readily understood by an inspection of the figure below. The rods, 4, 4, are firmly fixed and the rest of the device, including the rods, 5, 5, the blind and its supports, can be pushed bodily up and down on it. The supports, 1, 1, are fixed to the rods, 5, 5, by screws 17, 17, and 24, 24, they slide on the fixed rods at 16, 16, and 24, 24. The movable part can be locked to the fixed part by means of the pivoted cams 22, 22.

#### Apparel Shirt Bosom.

Men who have dressed themselves with great care and at the very last minute, perhaps, have suffered some accident which compelled them to change their shirt, will welcome the invention of Samuel Butz, of Easton, Pa., illustrated below. It consists of a false shirt bosom, which can be readily attached to or removed from a shirt, and which, despite the ease with which it can be adjusted, is held firmly in place beyond the possibility of slipping or rumpling. In its ordinary



form, this is fastened by the tab, 10, and the neck band, 7, which fastens to the rear collar button by the button holes, 8, 8, and by fabric straps, 9, 9, which are fastened to its inside surface. In the dress form of bosom, pockets are made in the shirt along each side into which the edges of the bosom are slipped. In a still more dressy form, stiffeners of whalebone or some such substance, are slipped down the pockets, thus absolutely preventing rumpling.



## SEWAGE IRRIGATION

## PART V.

## Definition and Methods of Applying Same.

Broad irrigation means the distribution of sewage over a large surface of ordinary ground, having in view the maximum growth of vegetation (consistent with due purification) for the kind of sewage supplied.

Ordinary irrigation, which consists in the application of water to the soil in order to assist the growth of plants, has been practiced from the earliest days in Assyria, India, China, Egypt, Italy, France, Spain and in portions

other form of farming. The odor of manure is unpleasant, although not specially unhealthful. Undoubtedly there are many barnyards, both in town and country, which are more unpleasant to the sense of smell than well-regulated sewage farms. It may be concluded, therefore, in the light of present experience, that an objection to sewage farms on account of serious effluvia nuisance is not well founded. It is further true that all sanitarians agree that the proper place for disposing of such town refuse is on land. When applied there with due reference to present information as to the nitrifying process, there is no reason for the production of specially bad smells.

For the best results the topsoil of a

nary practice is simply to make earth ditches, with flat slopes. As to the best size of the field for irrigation, everything depends upon the quantity of sewage to be disposed of and the character of the soil. On this point the advice of someone of experience in sewage farming will be especially valuable.

From present understanding, the proper method of procedure where the conditions admit, is for towns to provide intermittent filtration areas on which sewage can be cared for and efficiently purified whenever it is not needed for purposes of agriculture. Such an arrangement will permit it to be used under the conditions laid down by Professor Way; that is, so that the farmer may take it when he needs it and let it alone when he does not. During the season of actual growth, when sewage would be naturally used for irrigation, the filtration areas would be allowed to rest, thus perfectly fulfilling one necessary condition already discussed in treating the subject of intermittent filtration.

As thus employed, there is no doubt that sewage irrigation may be made immensely profitable in all parts of the United States. This is said advisedly because there is a notion that in the eastern part, at any rate, the rainfall is sufficient to meet all the requirements of agriculture. It requires, however, only casual study of the history of irrigation in foreign lands to learn that this impression, like many other popular ones, is true only to a moderate degree.

Possibly the objection may be raised that under this arrangement the towns themselves would not realize a profit on the sewage. This, however, is not a matter of any moment. The towns really owe it to the riparian proprietors on the streams below the points where sewage enters not to so foul the stream as to create a nuisance. It is a natural right of the riparian owners to demand that sewage pollution be prevented. It is a duty, therefore, on the part of towns to purify their sewage before allowing it to enter streams. If, in the process of such purification, the towns can realize even a partial return, they have so much clear gain; they should look upon it as a partial recoupment of a necessary expense which would otherwise be much larger.

Experience has shown that there is no objection to raising crops on the intermittent filtration areas, and on several of the English sewage farms, as well as on those of Germany, this practice is quite common. It has also been done at South Framington, Mass.; at Plainfield, N. J., and at other places in the United States.

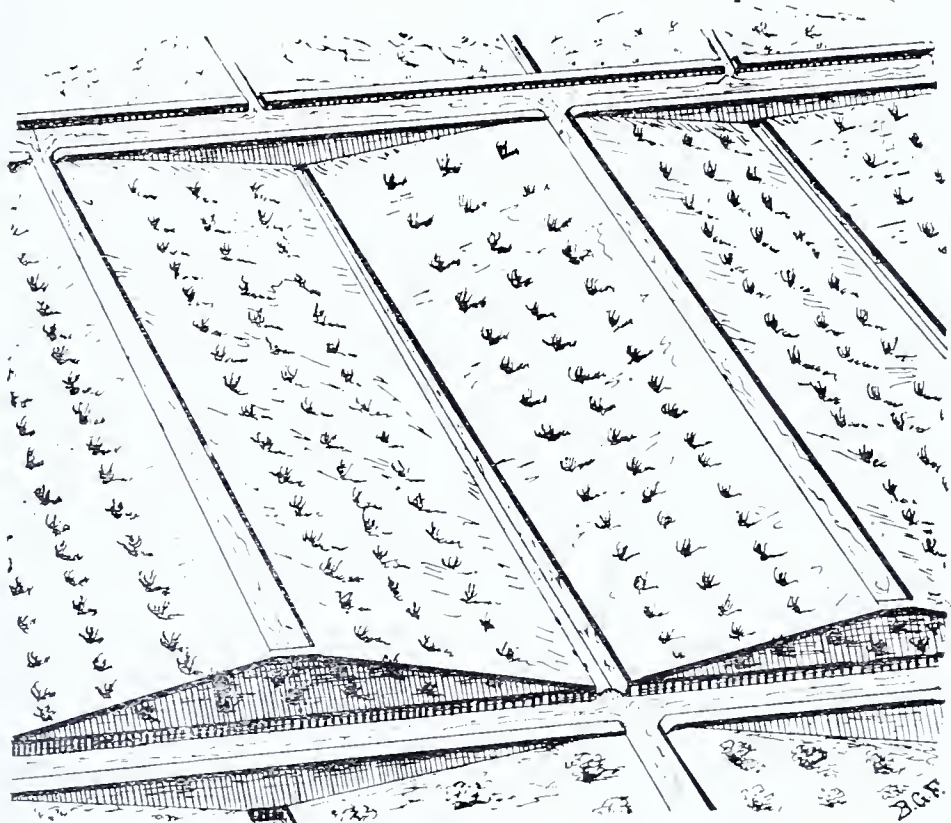
As already stated, the methods of applying sewage in broad irrigation are substantially those of ordinary irrigation, except for the necessity for closer attention to details. The principal special systems of irrigation used in sewage farming are known as, (1), the "ridge and furrow" or "bedwork system," and, (2), the "catchwork" system. Great variations from these two systems may, however, be allowed. Less important are the "pipe-and-hydrant" system, and the "level-bed" system, used

when the filtration areas for intermittent filtration are utilized for raising crops.

In laying out land for the ridge-and-furrow system, a series of slope beds are prepared, along the top of which supply carriers are laid, which are formed with level edges, so that the water flows over and down over the slope beds in a thin film of uniform depth. At the foot of the slopes a furrow is formed, which receives any sewage not absorbed in the passage over the beds and conducts it away to another and lower series of beds or to the outfall, as the case may be.

In the catchwork system, which is more especially adapted to steep and irregular land, the liquid is delivered at the highest point of the area into a main carrier ditch with a level lip on the lower side, which is built along the line of the highest contour. It is permitted to overflow at places where temporary dams are placed along its course. At some distance lower down a catch gutter is formed on the contour, into which the unabsorbed overflow of the main carrier is caught as it flows downward. A damming of the catch gutter at suitable intervals causes it to overflow to a second one just as in the case of the main carrier, and so on, down to the lowest contour of the land irrigated.

The great difference between the ridge-and-furrow system and the catchwork system is in the laying out of the ground. In the catchwork system, although the natural inclination of the ground is taken advantage of in the most direct and simple manner, still a considerable inclination is necessary for its successful application. The ridge-and-furrow system, on the other hand, is more especially applicable to flat ground, such as is usually found in valleys or along the banks of rivers. In this system the necessary inclination is given by artificially throwing up the ridges, and the skill with which one part is taken advantage of to make up the deficiencies of another part, will determine the degree of economical success. Generally speaking, the catchwork system is much cheaper than the ridge-and-furrow system, and at the present time the ridge-and-furrow system is only used where the ground is exceedingly flat or where for some special purpose the catchwork system is deemed to be specially undesirable.



RIDGE AND FURROW SYSTEM.

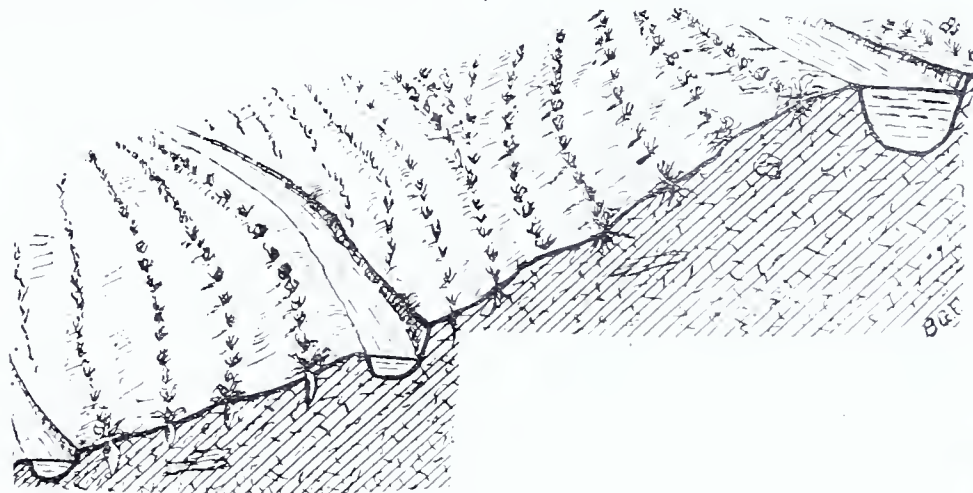
of England. Sewage irrigation, on the contrary, is, so far as known, a modern development. It has for its purpose the purification of the water which has been employed in carrying away the refuse of towns. The methods of applying sewage water do not differ greatly from those used in ordinary irrigation, except that by reason of the quality of the material which sewage water carries in suspension and solution, special attention to details is required, in order that the sewage water may not come in direct contact with the growing plants.

In selecting ground for a sewage farm, account must be taken of the relative elevation of the farm and of the town, manufacturing establishment or residence from which the material comes. Whenever possible, as a matter of economy, the farm should be selected so that the sewage may reach it by gravity. If, however, the location does not admit of this, pumping may be resorted to, although this frequently will entail considerable additional expense in first cost of plant as well as in the annual outlay for operation and maintenance. In some cases, where land within a short distance, can be reached by pumping, carefully prepared estimates, taking into account all the elements of first cost as well as the annual cost of maintenance, may show that it is cheaper to deliver the sewage a long distance by gravity than a shorter distance by pumping.

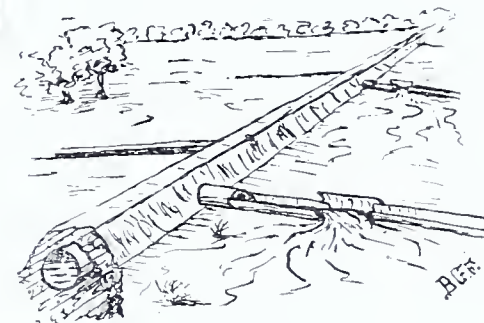
Formerly, it was also considered important to select a sewage farm with reference to the surrounding inhabitation, because there was a prejudice against such farms on account of the assumed liability of effluvia nuisance. This objection has much less weight now than it formerly had, because experience has fully demonstrated that with proper management a sewage farm is no more objectionable on account of bad smells than any

sewage farm should be of a permeable character, with a gravelly or sandy subsoil. If it be compact clay, the sewage cannot enter, and the only purification attained will be that due to coming in contact with the soil by flowing over it. Clay soils, therefore, are not so satisfactory for sewage farming as open, gravelly soils, and although it is possible to treat the sewage and prepare the farm as to attain a very high degree of purification even with clay soils, the chances of doing this at a commercial profit are exceedingly small.

If not naturally level or of very uniform slope, a sewage farm should be leveled, so that the sewage may flow equally over every portion and the best results be obtained. It should also be laid out with distributing channels, having the proper inclination to deliver the sewage readily to all parts of the farm. Formerly it was thought necessary to line the carriers with earthenware, concrete or other impervious material, to prevent the sewage sinking into the ground during its passage along them, but now the more ordi-



CATCH-WORK SYSTEM.



PIPE SYSTEM.

In a pipe-and-hydrant system of distribution a series of pipes is laid according to such a system (depending upon the topography) as will admit of reaching every point of the area to be irrigated. Formerly iron pipes were used for this purpose, but at the present time terra-cotta or vitrified tile pipes are commonly used. Hydrants are placed at proper points, fitted with the usual coupling for connecting hose. Sewage is forced through these pipes, either by steam power or gravitation, as the case may be, and distributed over the surface of the fields.

In a gravitation system a receiving tank is usually placed at a convenient elevation above the area to be irrigated, from which mains are laid to different parts of the irrigated area. In such a system the power with which the sewage flows from the hydrant is necessarily fixed by the height of the tank, while in a pumping system the power can be varied as in any other application of pumping.



# *Inventive Age*

## AND PATENT INDEX.

Established 1889.

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WASHINGTON, OCTOBER, 1900.

### Paper from Turf.

According to the business columns of a Riechenburg newspaper, an Australian manufacturer, in his search for a cheap raw material for paper making, has successfully experimented with turf. It is alleged that from the cleaned and bleached turf fibers, he produces a remarkably durable paper substance. His method is said to have been patented in various civilized countries and to be meeting with gratifying success. Paper of various kinds, pasteboard, and paper boxes are now made out of turf and are declared to be of good quality and to have great power of resistance.

### Dangerous Silverware.

Consul Schuman, at Main, has warned the American public against using certain kinds of silver mounted glass and porcelain ware, made in Germany and largely imported into the United States.

The silver on these articles is applied by means of a galvanoplastic process, in baths which contain very large quantities of potassium cyanide. As glazed wares have innumerable hairlike cracks, this deadly poison enters these cracks, and the articles, beautiful to look at, become a severe menace to the health of anybody using or handling them, especially as it is impossible in the course of manufacture to remove this poisonous residuum.

### Electricity in Agriculture.

Wonderful statements in reference to the application of electricity to agriculture, and the enormous increase in the size and quantity of the product, as a result of the application of this mysterious force, reach us from both Russia and Ireland. In the former, Messieurs Tyurin, Spyeshnoff, and Krakovoff have shown that by placing vertical plates of copper and zinc in the soil and connecting them by wire the size and weight of vegetables can be greatly increased. From Limerick, Ireland, comes the news that the Rev. Father Given has succeeded in increasing the yield of potatoes 90 per cent., by employing

the electric current, but in this case the method of application is not given. It is to be assumed that it was by conducting the current through the soil.

### Diving Extraordinary.

For years it has been the dream of divers to be able to abandon their air pipes and wander at will over the bottom of the sea, but so far, although many devices have been tried for the purpose, none have met with practical success. Now, however, two French chemists, M. Desges and Balthazard, have hit on an ingenious chemical apparatus, which, from all reports, appears to work well. The chemical employed is bioxide of sodium, a white salt made by heating the metal sodium in oxygen gas until the sodium is supersaturated with the life sustaining element. The sodium retains the oxygen, it appears, so long as the bioxide is dry, but when the latter is moistened, it slowly gives up its oxygen and becomes ordinary caustic soda, which is a greedy absorbent of carbonic acid gas. A man, accordingly, placed in a very small room, with a supply of sodium bioxide, can renew his supply of oxygen by moistening the salt, at the same time have the carbonic acid gas he breathes out, absorbed by caustic soda. Thus the air remains comparatively pure, being neither impoverished by the oxygen he breathes in nor poisoned by the carbonic acid he breathes out. As sodium and oxygen can be cheaply manufactured, there seems to be a practical future for the idea.

### New Uses for Wood Fibre.

Inventors would do well to turn their attention to finding new uses for woody fibre, which has recently been discovered to be capable of many interesting applications. Cupro-ammonium, for instance, will dissolve paper, cloth, sawdust, splinters, or anything of the kind as if it were sugar, and will weld it into a coherent mass, which is waterproof and may be treated as desired. To waterproof a single sheet may be of little use, but if the process is applied to two sheets, and they are passed between steel rollers, the two surfaces will adhere so powerfully after drying that the junction will not only be invisible, but cannot be rendered visible by any means whatever, and, except when, by chance, two pores in the sheets happen to come exactly opposite, there will be no break in continuity.

What can be done with two sheets can be done with any number, and thus artificial woody plates of any desired thickness, from that of paper to that of a board may be obtained. These plates, when moist, are very easily molded, but become stiff when corrugated or subjected to pressure. Extremely light, solid, indestructible by water, and not easily attacked by acids, they may replace corrugated iron in a great number of applications. Ammonia is the sole agent that can not be resisted by cellulose thus treated.

### Prevention of Hail Storms.

Some years ago attempts were made in the south western portion of the United States to produce rainstorms by firing cannon and by exploding dynamite which had been raised high

in the air by means of balloons. The experiments, while not total failures, were yet not successful enough to warrant continuing them. An effort to use the same means to produce an effect almost exactly the reverse, is now being made in France, with, it is claimed, a fair amount of success. Some seventy cannons have been distributed over an area of 2,500 acres of rich vine land, which is ordinarily more or less severely damaged by hail storms. When a storm begins, the cannon are fired, at first twice a minute, but more slowly after the first ten shots, in the hope of driving the storm away or at least of preventing the fall of hail. The results obtained from these experiments are such that organizations will, it is said, be established at once in all the places that have heretofore been ravaged by hail.

The practice of shooting at the clouds was known in France over a hundred years ago. It originated in Italy, and is to be more extensively carried on this year than ever before.

### The Telephonograph Again.

Those familiar with the life of Col. Mulberry Sellers as set forth by Mark Twain, will remember his purchase of a perpetual motion machine, which he clearly saw required only one more cog to make it work to perfection. After the machine had been bought and the cog inserted, it turned out that something else was needed.

Such is too often the fate of inventions which are announced with a great flourish of trumpets. For instance, the last number of the AGE contained a description of the telegraphophone, or telephonograph, an instrument designed to combine the telephone and phonograph so as to preserve the messages sent over the wires of the latter. Now, it is announced by the owners that the machine has not yet been perfected, although in anticipation of final success, the patent rights have already been disposed of in most of the countries of the world. The managers of the German syndicate, which controls the invention, have written as follows to Consul Worman, at Munich, in reply to certain inquiries addressed to them through his office:

"We thank you most sincerely for your kind offer to assist us by your personal co-operation in the development of the telegraphophone patents. We regret to have to inform you that we are not in a position to give you the exact information that you desire, as our attempts to produce the telegraphophone in the highest possible perfection have not yet been successful."

### A Giant Phonograph.

An instrument something in the nature of a combination of a phonograph and a siren has recently been tried at Brighton, Eng., and is said to have worked to perfection. According to reports, it reproduces words with an intensity which makes them distinctly heard at a distance of ten miles on land and still further on water. Inside the trumpet, there is a small and delicate piece of mechanism that looks something like a whistle. This is the tongue of the machine. Instead of the phonograph "records" being taken on wax in the usual manner, a sapphire needle is made to cut

the dots representing the sound vibrations on a silver cylinder, and when the needle travels over the metal a second time the vibrations cause the whistle to produce a series of air waves, the machine thus becoming a talking siren which transforms the human voice into a deafening roar. The fault with the ordinary siren is that its sound is much deadened when there is fog, which is, of course, the very time when it is most needed. It remains to be seen whether the new apparatus is equally subject to this drawback. If not, the time may soon come, when the sailor cruising near a dangerous spot, may hear a voice coming from nowhere and uttering some such words as follows: "—you, get away from this—rock here, or you'll knock a hole in your—bottom, ———you!" The dashes, of course, represent the expletives, without which, it is claimed, that sailors cannot comprehend an order.

### The Pollok Prize.

An echo of the terrible Bourgogne disaster comes from Paris, in the announcement of the list of inventions for saving life at sea, submitted in competition for the prize of \$20,000 for the best device for that end offered by the heirs of the late Mr. Pollok, who was drowned in that catastrophe. One of the devices offered is a steel life-raft, built in cellular compartments for air chambers. One device employs this raft as the captain's bridge on an ocean steamer. Another shows it stowed on top of the deckhouse. In both of these methods a thoroughly practical apparatus, with which the ship is equipped, enables two persons to launch the raft right side up with the utmost speed. When this apparatus, hastily sprung into position by turning a crank, is in place the raft glides smoothly to the sea surface even if loaded to its maximum capacity. Oars or sails may be employed as a motor for the raft. Another practical British exhibit is a plan for closing the bulkhead doors. The machinery is actuated by electricity, by hydraulic or steam pressure or automatically. By the simple turning of a lever requiring a minimum of force all the bulkhead doors of a ship may be closed simultaneously from the captain's bridge or the chart house. This is considered a most valuable contribution to the means of preventing wholesale loss of life at sea. A New York city inventor sent a model oil rocket for spreading oil on sea. The mortar or cannon shoots a metal projectile a distance of a couple of hundred yards. The projectile is loaded with oil, which is automatically released by the impact of the falling object against the water. The class jury is said to have been much impressed by this invention. One odd invention presented was a model of a ship with a projecting rubber belt, fitted on rubber springs covering the entire circumference of the vessel. The purpose of the armour was to serve as a buffer in case of collision. Another singular claimant for the prize was a set of life-saving pajamas which looked just like any other garment until the wearer fell into the water, when they inflated themselves, and required fifteen horsepower to pull them under.



## THE INVENTOR'S GHOST TRAP,

BY

CRITTENDEN MARRIOTT.

"So many false stories have been circulated in regard to the recent distressing death of Mr. Frank Vaughn," said the professional inventor, "and my connection therewith, that justice to myself, no less than to his memory, requires that I should lay before the public all the circumstances connected with that event. I am confident that all unprejudiced readers will acquit me of blame, and will hold that Vaughn's death was wholly due to his daring experiments with mysterious forces that would be much better left alone."

"The incidents that led to his death began about two years ago, when his wife suddenly died. He took it very hard for a time and then began to turn his great inventive genius to devising some means of communicating with her. Finally he began to tell me of written messages which he said that he had received from her in trances. He also asserted that he continually heard her voice sounding in his ears. This, he told me, was growing on him. He heard her oftener than at first, and at times he almost fancied that he could see her dim shape hovering over him. Of course, I was convinced that this was incipient madness and I tried hard to induce him to abandon his attempts. He listened patiently, but refused to do so."

"The next time I visited Vaughn, I found him engrossed in a subject which was at that time convulsing the world. A German scientist had discovered what he called the "X-Rays," and everyone with the necessary apparatus was making experiments to test their wonderful powers for himself. These rays are an old story now, but at that time intense interest was taken in them. Vaughn, like the rest of us inventors, was deeply interested, and at the moment of my call, was hard at work making shadow pictures."

"You are the very man I wanted, old fellow" he exclaimed, "I am going to try an experiment and I want your aid. Will you help me?"

"What is it," I asked, curiously.

"An X-Ray experiment," returned my friend. "Of course, I know that you must be familiar in a general way with the properties of those wonderful rays. You know, for instance, that by their aid we can take shadow pictures of some substances through others that are opaque to the ordinary vision. For example, a piece of iron or lead can be clearly defined through a wooden board, although both are equally dense to our eyes. You know all this, of course."

"Of course," I returned.

"Well, there is another phase of the subject with which you may not be acquainted. This concerns itself with the fact that some substances that are transparent to the eye, are opaque to the X-Rays. Glass, for instance, so clear to the sight, is far more dense to the X-Rays than is wood or leather. It is on this singular quality that my experiment is to be based. By successive tests I have learned that while ordinary sand-glass

casts a dark shadow under the X-rays, the clearer Brazilian pebbles cast a much darker one, while a crystal lens casts a still darker one."

"I conclude, therefore, that if I can find a perfectly transparent substance—one so clear that the eye can not perceive it at all, and whose very existence can only be ascertained by the sense of touch; that is to say, an invisible yet tangible substance, it will probably be absolutely impervious to the X-Rays, and will cast a dense black shadow."

"This brings to me the point. You are aware that in all ages of the world there have been tales of the existence of beings ordinarily invisible to human sight. These have been variously termed ghosts, spirits, fairies, imps, and so on. Now, why is it not possible that such creatures do exist, and are of some perfectly transparent substance invisible to the ordinary eye, but which, like the purest crystal, is visible under the X-Rays? Why may it not be that these beings are sometimes visible through some peculiar condition of the atmosphere, which is equivalent to a temporary suffusion in the X-Rays?"

"I believe that the true explanation of many puzzling phenomena is to be found right here, and I propose to test the matter. Will you help me?"

"I hesitated for a moment, but finally agreed and followed Vaughn into his laboratory, where a small table with pens and ink had been placed just before a camera. Nearby stood a huge X-Ray apparatus."

"Now," said Vaughn, "here is where I sit when I receive communications from my beloved wife. I go into a trance and she guides my hand as I write. I want to get a picture of her glorified features. If my theory is correct I shall do so. I will go into the mediumistic state. Your task will be to wait until you see me begin to write, and then turn off the gas and turn on the light in the X-Ray apparatus here. If I am right, you will obtain a photograph of the glorified features of my beloved wife. Give the plate an exposure of ten seconds. You can time yourself by counting."

"Vaughn's excitement was intense, and kept him for a long time from falling into the mediumistic condition, but finally he did so. His eyes took on the glassy stare of the sleep-waker, and his body perceptibly stiffened. The next instance he began to write with feverish energy. With a sudden motion I turned the switch, and instantly the room was plunged into darkness, in which I began to count aloud. 'One, two'—was that my voice? It seemed very strange and distant. 'Three, four, five'—how still everything was. I seemed to be counting in a tomb. 'Six, seven'—I could distinctly hear Vaughn's pen scratching on the paper. 'Eight, nine, ten'. With a burst of relief I reversed the switch, and the friendly gas once more illumined the room."

"Vaughn was still writing with frightful speed. I glanced over his shoulder at the paper. It was covered with the most awful blasphemies, with threats, curses, imprecations. With fear tugging at my heart strings I grasped him by the shoulder

and shook him roughly. In a moment he came out of his trance. The cold sweat stood upon his forehead, and his cheek was pale as death. 'Horrible, horrible,' he muttered, still half dazed. Then, recovering himself, he sprang to his feet. 'Did you take it?' he demanded?"

"Yes."

"Give it to me."

"He hurried to the camera and tore the plate holder from its interior. 'Into the dark room,' he cried. 'Hurry!'"

"I caught him by the arm. 'Wait a little, Vaughn, you are overwrought,' I exclaimed, 'the nervous strain will kill you. Wait!'"

"He shook me off with a wild laugh, and hurried into the dark room, where I unwillingly followed him. The door was quickly closed, and the red light threw its lurid gleam on the plate as Vaughn drew it from the holder and poured the developer upon it. A moment more and his voice broke the silence. 'It's coming out,' he cried, feverishly."

"I bent over his shoulder and looked at the plate. A dim shape was slowly taking form upon its white surface. It was Vaughn, first his face, then his figure, then the table

over which he bent, then the—What was that thing that seemed to hover over him?"

"It grew clearer and clearer, and I seemed to decipher the outlines of a ghostlike figure, when Vaughn's head, drooping lower and lower over the plate, cut off my view. For a moment dead silence, while I heard my own heart-beats thundering. Then Vaughn sprang to his feet with an appalling shriek, a shriek that will ring in my ears until I die. Back he fell in a huddled heap in his chair."

"Over his body I gazed at the plate, now fully developed. Over the picture of my friend bent an awful form, whispering in his ear, guiding his fingers with its frightful talons. But the face! God in Heaven! Could mortal man look upon that sight and live? For a moment I gazed with reeling brain, while it blasted its way into my consciousness, searing its image upon my very soul. Shall I ever forget it? Then the merciful light, streaming in from the other room, blackened and ruined the plate, blotting the grisly horror from human view forever, while I staggered blindly back and fell senseless across the dead body of my friend."

## IMPORTANT COURT DECISION IN PATENT AND TRADE MARK CAUSES.

U. S. Court of Appeals for the Dist. of Columbia.

KELLEY v. FLYNN. Decided June 6, 1900.

1. INTERFERENCE—BURDEN OF PROOF—APPLICANT AGAINST PATENTEE.

Where the junior party has a patent to contend with and he was induced to file his application by a perusal of that patent, *Held* that the burden of proving his case beyond a reasonable doubt is upon him.

2. SAME—DELAY IN FILING APPLICATION.

Where the appellant took out seven patents on other inventions after the alleged reduction to practice before he filed his present application, *Held* that his delay and apparent indifference in regard to an application until after he saw the patent of the appellee are significant.

3. SAME—EVIDENCE OF REDUCTION TO PRACTICE.

Where it appears that a machine of full size was made for the purpose of study and with the expectation that it would be used as a model for others if it was decided to manufacture them, and that after it was tested several experimental changes were made in it, but there is no satisfactory evidence that it operated practically and successfully, *Held* that it was not a reduction to practice.

4. SAME—SAME—EXPERIMENTAL MACHINE.

Where a party's testimony as to the operative character of a machine which he built is not satisfactory and no witnesses are called to corroborate him, although it appears that others must have been familiar with the tests of machine, *Held* that the almost unavoidable inference, both from the testimony itself and from the omissions in the testimony, is that the machine was experimental and was not a reduction to practice.

5. PRIORITY INVENTION—DECISION OF COMMISSIONER AFFIRMED.

Although the preponderance of evidence may be with the appellant, *Held* that he has not established his case beyond a reasonable doubt, and therefore the decision of the Commissioner of Patents awarding priority of invention to the appellee affirmed.

## Decision of the Commissioner of Patents.

LEPRINCE v. ILLER &amp; MORRIS. Decided June 16, 1900.

1. TRADE-MARK INTERFERENCE—PRIORITY—ADOPTION AND USE IN FOREIGN COUNTRY.

In an interference between a registrant and an applicant, the latter being the last to adopt and use the trade-mark in the United States, although having adopted and used it in a foreign country prior to the adoption and use by the registrant in the United States, *Held* that priority of adoption and use must be awarded to the registrant in the absence of any proof of fraud on his part.

2. SAME—SAME—SAME.

I. & M., registrants, filed their application on June 2, 1885, and a certificate of registration was issued to them on July 14, 1885. L., an applicant and junior party, filed his application on November 30, 1898, and proved adoption and use of the mark in France about January 1, 1880. He did not use the mark in the United States prior to June 2, 1885. *Held* that I. & M., on this state of facts are entitled to an award of priority.

3. SAME—SAME—SAME.

Where L. insists that he is the lawful owner of the trade-mark in France and that he is entitled under the treaty relating to trade-marks existing between France and the United States to an award of priority and to receive the same privileges in this country as in France, *Held* that he is entitled to no other or further rights because he is a citizen of France than if he were a citizen of the United States, and a citizen of the United States is not entitled to avail himself of foreign adoption and use over another party who has adopted and used the mark in this country.

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## MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been recently procured through the Patent Soliciting Department of E. G. SIGGERS, Washington, D. C.

Nils M. Wig, Alexandria, Minn., Horse Shoe.—The calks are made of harder material than the shoe proper so as to withstand the greater wear to which they are necessarily subjected. This is accomplished during the operation of casting by placing the calks in the mould and pouring the metal for the body of the shoe about them. This, upon hardening, holds the calks firmly in place.

Charles H. Wilkin, Savanna, Ill., Automatic Grain Scale.—A grain receptacle is hung to one end of a suitable scale beam and provided with an oscillating partition, to the shaft of which is secured a tension spring. A pair of hooks are arranged to lock the partition on either side of the receptacle. The grain to be weighed is deposited in the receptacle on one side of the partition, and as the predetermined weight is reached, the receptacle drops slightly, releasing the partition from the locking hook and allowing the grain to escape. It then automatically locks in the other position and the operation is repeated.

David E. Williams, Eagleport, Ohio, Vehicle Brake.—This invention provides friction wheels arranged on the hubs of the hind wheels and partly encircled with bands which are connected with an operating device in the front of the vehicle. When operated, the band clamps the friction wheel and forms a secure brake. The construction is especially useful on rubber tired wheels.

Warren Hull, Gasport, N. Y., Printing Frame.—By this invention, pictures may be printed from a film without the necessity of cutting up the latter and without the danger of creasing, so often incurred where the films are printed in an ordinary frame. In this device, the strip of negatives is wound upon a spool and passes across an opening in the frame where it is printed. The device is a great improvement in the art and will find decided favor.

Michael F. Young, Chester, Michigan, Threshing Machine Attachment. A pair of crank shafts support and actuate a series of forks just above the grain pan. These forks are so operated that they carry the straw quickly from the concave and violently agitate it, thereby thoroughly separating the grain from the straw. The invention comprises means for adjusting the several parts and altogether is a decided improvement in the art.

Daniel Biggs, Denton, Texas, Washing Machine.—A frame having means for attaching it to a washtub carries a pair of rollers yieldingly held against a central operating roller. This machine provides a simple means whereby clothing may be quickly washed without injury and without tearing off or breaking the buttons.

Thomas W. Crozier, Roanoke, Va., Nut Lock.—The present invention comprises a washer having a series of spurs which engage the thread of the nut and hold the washer against rotation. The outer edge of the washer is provided with a series of projections which engage the edge of the nut. The device forms a reliable lock for the nut.

Richard B. Dixon, Toronto, Canada, Rotary Engine.—By a novel construction and arrangement of parts, including the means for controlling the operation of the abutment, an engine of this class is produced which prevents all hammering and undue friction. A novel method of packing is also employed.

Richard and Ira W. Knight, Moscow, Idaho, Traction Engine.—This wheel is so mounted and arranged that it may be turned in any direction desired. A further improvement in the construction enables the power running the machine to be applied to the steering wheel, a practical advantage that will be greatly appreciated.

Gideon S. Adams, Camden, N. J., Bicycle Gearing.—In the present invention two sprocket wheels of different diameters are arranged on the back wheel and two similar sprocket wheels are mounted on the crank shaft and connected with those on the wheel by suitable sprocket chains. A clutch is arranged upon the crank shaft and provided with operating means which enable either gear wheel to be engaged, thus making a simple and practical changeable gear.

John Ahrends, Sunman, Indiana, Newspaper File.—A pair of leaves are hinged together and means are provided for locking them in their open or closed position. These leaves are adapted to support newspapers or magazines while being read and can be held in a wide open position by one hand while the other is free.

James W. Case, Ypsilanti, Mich., Mattress.—This invention comprises a mattress made up of sections whereby it can be compactly rolled or folded so as to occupy a small space. It is so constructed that it will evenly distribute the weight upon the bed-springs, and each section is provided with ventilators whereby the mattress is kept in a thoroughly sanitary and hygienic condition.

Frank Faucett, Saybrook, Ill., Grinding Machine.—This is an invention that is destined to become exceedingly popular with agriculturists. It comprises a portable machine adapted to be driven by hand and having grinding elements so arranged that they may be operated upon disks, sickle knives and other blades without the necessity of removing them from the machine of which they form a part.

Edwin J. Herchert, Garnaville, Iowa, Rotary Engine.—By a novel construction, a compact and efficient reversible rotary engine is provided, wherein the maximum expansive force of the steam is utilized. At the same time there is no back pressure and all wear between the several parts is taken up.

Claude V. Holland, Dallas, Texas, Newspaper Sealing Machine.—This machine is so constructed that it will seal newspapers, books and the like, and will work with equal facility upon publications of different thicknesses. It comprises means whereby a strip of paper is automatically fed to a proper length, gummed, cut off, folded and pressed around the paper and stamped. All of these devices are operated by a single shaft under the control of the operator.

Edward J. Kirk, Bracebridge, Canada, Hat and Cap Rack.—The present device is particularly adapted as a display rack for stores and comprises a horizontal frame which carries a plurality of adjustable hangers. The rack

is adapted to be supported from a ceiling and provides a convenient and advantageous means for displaying hats, caps and other articles.

Albert Kresen and Frank and Andy Leasman, Buffalo Lake, Minn., Wind Mill.—Mechanism is provided in connection with the windmill whereby the reciprocation of the rod is converted into rotary motion. This is accomplished by having a drive wheel and two oppositely working clutches arranged on its opposite sides. These clutches are connected with the windmill rod, so that upon a down stroke one clutch is loose while the other is in operative position and vice versa upon an upstroke.

Alexis Lindquist, DeLand, Florida, Gate.—This device is a decidedly novel improvement and comprises bars arranged across the road at suitable distances on each side of the gate. These bars are connected by suitable mechanism with the gate so that, as a vehicle passes over one, the gate will be automatically opened, and closed after the vehicle has passed through and has gone over the opposite bar. This will prove a great convenience, as it requires absolutely no attention on the part of the occupants of vehicles.

Fletcher H. Mitchell, Cerrillos, New Mexico, Blanket Holder.—The present invention is a single device that retains the blanket in proper position upon the animal and prevents all possibility of its becoming accidentally displaced. The essential feature consists of a weight with attaching means, whereby it may be applied to the pendulous sides of the blanket and hung beneath the animal. The device holds the blanket in place by the gravity of the weight, so that no matter what position the animal may take, the blanket will always be properly adjusted.

George N. Windle, Frazier's Bottom, W. Va., Vehicle Brake.—This brake is self-adjustable so that an equal pressure will be applied to both wheels. The invention also includes an equalizing traveller connected with a system of multiplying pulleys around which runs a flexible brake connection, by means of which any desired power can be applied. The several parts are also adjustable so that the mechanism can be applied to any vehicle of any size.

William S. Rice, Adams, New York, Trade Mark.—This trade-mark consists of the arbitrary word "Lymphol" and the class of goods to which it is applied is a medicine for the cure of rupture.

Joseph C. Bissel, Mapleton, Minn., Grain Weigher and Bagger.—This machine comprises a very simple mechanism adapted for weighing grain, and capable of discharging it afterwards into a bag or sack, special means being provided for holding the bag in position with its mouth open to receive the grain.

Thomas J. Kitto, Doe Run, Missouri, Drill Chuck.—While this invention may be used in a variety of ways, it is especially adapted for use in connection with rock drills. The clamp, which readily adjusts itself to different sizes presents many advantages, the principal of which resides in having a direct grip and uniform pressure on the drill shank. At the same time, by a slight loosening of the clamping bolt, the drill will be released, and when replaced, may be securely held by a slight manipulation of the tightening screw.

Madison and John Bowman, Toledo, Illinois, Threshing Machine.—The object of this invention is to improve the construction of cheat opening covers so that the operator may not be compelled to lie on his back under the machine while adjusting or removing the cover from the opening. The construction is such that the operator may stand at the side of the machine and by operating a suitable lever open or close the opening at will.

Joseph H. Miller, Oklahoma City, Oklahoma, Ink Well.—The present invention is unique and presents many advantages over the ordinary ink well. It consists in a closed reservoir which is in communication with the well and a bulb so arranged that, when compressed, the ink is forced from the reservoir into the well. A great saving in ink is thereby effected and all dust and dirt is excluded.

Martin D. Miller, Kansas City, Mo., Wrench.—In this wrench the movable jaw is provided with a handle pivoted thereto. The handle carries a pawl that engages a rack on the shank of the stationary jaw, thus making the two jaws easily adjustable. These jaws are so constructed that they may be used upon a nut or pipe with equal facility and a slight movement of the pivoted handle will cause a tight grip or will loosen the jaws as desired. It is a very handy and efficient tool.

Cyrus G. Spaulding, Springfield, Mass., Drip Cup for Refrigerators.—This is a very important improvement in this line and comprises a drip cup pivoted to the underside of a refrigerator and connected by novel means to an operating device at its front. By this means the cup may be emptied when the waste water receptacle is removed and all the water is temporarily received by the cup. The invention also includes means for preventing the splashing of the water.

James C. Walker, Waco, Texas, Wave Motor.—For a long time inventors have been trying with more or less success to utilize the tremendous force of the ocean waves. An important improvement in this line is the present invention which is constructed on practical principles. A rising and falling float is operated by the waves and through suitable mechanism operates machinery or pumps. One of the features of the invention is a novel construction which allows for the varying height of the waves, whereby a regular motion is imparted and all strain on the mechanism is obviated.

U. V. Remedy Company, Boonville, Mo., Trade Mark.—The present trade-mark is applied to a liquid medicine and consists of the letters REST, the representation of an eye, followed by the figure 2 and TION, and the word FLUID, making the representation of the words "Restitution Fluid," a very appropriate trade-mark for a good medicine.

Edward R. Gambell, Hendrick, Iowa, Harness Blind.—The present device is very simple but is evidently a very valuable one. It consists in a novel manner of attaching the winker strap to the blind, so that if the strap becomes disconnected or broken it may be readily replaced by any person, no matter how inexperienced.

Julia B. House, Lexington, Miss., Cane Stripper and Cleaner.—The present machine comprises a series of yielding knives which co-act with a stationary knife. These are arranged in close proximity to the crushing rolls of a mill and thoroughly strip and clean the cane before it passes between the same. The device is very simple and can be applied without trouble to a mill of ordinary construction.



**A** CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE, which keeps inventors and manufacturers posted in the art in which they are mostly interested.—The full address of any patentee, and number of patent found below sent to any address on receipt of one 2-cent stamp.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings upon receipt of 10 cents per copy; twenty copies for \$1.50.—Address THE INVENTIVE AGE PUBLISHING CO., 918, F St. N. W. WASHINGTON, D. C.

## LIST OF PATENTS

GRANTED FOR INVENTIONS.

ISSUED JULY 31, 1900.

Air cooling apparatus.....H. C. Gardner  
Albuminoids. Making non-coagulable.....A. Classen  
Allo citral. Making.....W. Krauth  
Article applicable for various purposes, together with process of manufacturing same.....J. E. Thornton, et al  
Ashes, &c. Device for removing.....M. R. Beritzhoff  
Automatic lubricator.....O. O. Kittleson  
Automobile truck.....H. W. Libbey  
Axle spindle. Self lubricating.....E. E. Baker  
Bag lock and catch.....G. Goerk  
Bags, satchels, &c. Fastening for.....G. Goerk  
Bail ear.....C. Puddlefoot  
Bail tie.....D. A. Cypher, et al  
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 Wurtzilite. Treating.....R. M. Thompson  
 Yoke. Neck.....H. Doering  
 Zinc from materials containing zinc. Obtaining oxid and carbonate of.....G. Rigg

Acid. Amido sulfonic.....J. Turner  
 Advertising apparatus.....J. A. Kennedy-McGregor  
 Aerator. Milk.....D. D. Kimberlin  
 Air-brake. Automobile.....I. L. Hammond  
 Air-power apparatus. Marine.....A. M. Becker  
 Air-purifying apparatus.....R. H. Thomas  
 Alloy.....G. H. Clamer et al  
 Alloy for antifriction-bearings, &c.....J. Philippi  
 Asphalt. Machine for separating rock.....A. F. L. Bell  
 Asphaltic material. Apparatus for extracting and refining.....W. O. Wayman  
 Autotruck for garbage, ashes, &c.....J. C. Anderson  
 Awl. Sewing.....E. C. Espey et al  
 Axle-lubricator.....J. E. Ludwig  
 Baby-exerciser.....C. E. Latshaw  
 Bag-fastener.....H. Adams  
 Bag-filling machine.....A. M. Bates  
 Bag-holder.....A. J. Hurd  
 Bags, purses, satchels, &c. Frame for.....L. B. Prahar  
 Bait. Artificial.....R. B. Cantrell  
 Banana-shipping case.....J. Jackson  
 Barrel-swing.....G. L. Edgerton  
 Bearing.....H. Fernstrom  
 Bearing for bicycles, &c. Spring.....F. L. Koehler  
 Beer-cooler.....G. Donges  
 Belt-striker.....E. D. Rockwell  
 Belt-fastener.....J. Hill  
 Bicycle.....J. C. Robbins  
 Bicycle handle-bar.....D. O. McAuliff et al  
 Bicycle mud-guard.....F. H. Welch  
 Bicycle-saddle and tool-carrier. Combined.....R. J. Dooley  
 Billiard-table.....R. W. Moffett  
 Binder and pad-holder. Temporary.....V. C. Routzahn  
 Bit.....M. McAlley  
 Bleaching by electrolytic chlorine water.....T. Jespersen  
 Blower. Fan.....R. Burns  
 Boat attachment.....R. M. Howe et al  
 Boiler.....2 pats. G. S. Stroug  
 Boiler.....N. P. Towne  
 Boiler-tube plug.....S. J. M. Berthet  
 Boiler wash device.....B. F. Keency  
 Boilers. Automatic circulating system for steam.....C. C. Upham  
 Book. Manifolding sales.....L. G. Reynolds  
 Boot or shoe. Ventilated.....J. J. Pearson  
 Boring-bar. Expandable.....J. Brown et al  
 Bottle-filling machine.....F. C. Keller  
 Bottle. Non-refillable.....J. M. Urgelles  
 Boundary-post.....K. Schneisser  
 Bowling-alley.....L. A. Scholz  
 Brake-setting and signaling apparatus. Automatic.....C. Bergmann  
 Brake-shoe.....J. Stromeyer  
 Bread. Apparatus for cutting altar.....T. M. Mulkerins  
 Bread box. Altar.....T. M. Mulkerins  
 Bread or cake knife.....J. Hamilton  
 Bread or cake pan.....M. Vossbeck  
 Bridge.....E. R. Woodruff  
 Broom.....F. R. Lay  
 Broom.....W. C. Price  
 Brush-handles. Means for attaching.....F. and G. Bauerle  
 Bubbles. Apparatus for making soap.....G. Kraft  
 Buckle. Belt.....L. and J. Ritter  
 Bungalow or fire alarm.....F. D. Wallace  
 Burial-case.....M. L. Keyes  
 Butter, &c. cutter.....F. Hardart et al  
 Cabinet.....H. G. Roth  
 Calculator.....G. J. Gnan  
 Cam-wheel.....F. E. Wells et al  
 Can and means for closing same.....G. H. Dunbar  
 Can-opener.....B. F. Pinnell  
 Can top and wiper.....W. S. Bristol  
 Car brake-gear. Railway.....M. B. Schaffer et al  
 Car. Charging.....F. D. Allen  
 Car-coupling.....D. Hawkins  
 Car-coupling.....W. McDonald  
 Car-coupling.....G. W. Smillie  
 Car end-gate fastener. Mining.....L. S. Morrow  
 Car hand-strap. Street.....T. E. Wardwell  
 Car. Street railway.....G. Moore  
 Carbonated beverage.....E. Funk  
 Carriage.....J. Klovstad et al  
 Carriage. Electric.....C. A. Lindstrom  
 Casket-rest.....T. W. Coughlin  
 Casting-machine. Automatic.....R. G. Collins  
 Castings. Means for identifying metal.....R. E. Coleman  
 Cement. Artificial.....L. H. M. Merceron-Vicat  
 Centrifugal machine.....D. Wilcox  
 Chains. Machine for manufacturing weldless.....J. W. Walles et al  
 Chair.....A. C. Greene  
 Chair-seat. Combination cobbler and bentwood roll.....F. A. Dennett  
 Chair-seat support.....H. Mortou  
 Chamber-pot, &c.....T. Hawkins  
 Churn.....T. J. Cheney  
 Cigar-wrapper.....F. E. Fonseca  
 Cigarette machine.....F. J. Lindington  
 Cigarette-making machine.....P. J. Leschander  
 Circuit-closer.....J. O'Meara  
 Cistern-cleaner.....W. DeMont et al  
 Clamp.....A. Carlson  
 Clothes-wringer.....F. R. Wells  
 Clutch mechanism.....F. G. Hobart  
 Clutches, &c. Shifter for.....A. C. Pessano  
 Coal-leveling machine.....S. Gorton  
 Coal-separator.....J. R. Richardson  
 Coin assorting, delivering and recording apparatus.....S. S. Boyd  
 Coin-holder.....J. B. Mercer  
 Collar. Apparel.....L. F. Adt  
 Collar. Apparel.....W. A. Pine  
 Comb.....G. Wolff  
 Concentrator.....W. H. Washburn  
 Controller.....E. M. Fraser  
 Conveyor. Portable.....J. A. Smith  
 Cooking utensil.....A. Smith  
 Copal gums. Dissolving.....G. C. Lyman  
 Cord-fastening device.....O. Wallman

Corn-husking machine.....M. H. Madsen  
 Cotton elevator and distributor. Pneumatic.....T. C. Eberhardt  
 Cotton-press.....W. W. Kruttsch  
 Crane.....W. H. Morgan et al  
 Crane.....J. W. Seaver et al  
 Craue.....S. T. Wellman et al  
 Crate. Folding.....Z. B. Taylor et al  
 Current transmission. System of alternating.....J. H. F. Gorges  
 Currents into continuous currents, and vice versa. Apparatus for transforming alternating.....M. Hutin et al  
 Currents into continuous currents, and vice versa. Transforming alternating.....M. Hutin et al  
 Curtain or portiere fixture.....G. A. Johnson  
 Cutting elliptical holes. Machine for.....J. S. Worth  
 Detachable clamp or name-plate.....S. J. Cobean  
 Dish-washing machine.....G. S. Blakeslee  
 Dividers.....W. A. Bernard  
 Dock. Sectional floating.....W. Jamieson  
 Door-lock and alarm. Portable.....A. L. Shore  
 Door shoe-fly attachment.....W. T. Johnson  
 Draft-equalizer.....J. A. Beltz  
 Dry closet and inclinator.....F. P. Smith  
 Drying-machine.....R. Simon  
 Drinking-cup. Magnetic.....H. A. Parkyn  
 Drum. Hot-air.....J. F. Beck  
 Dust-collecting apparatus. Certain for.....A. S. Dwight et al  
 Dust-collector.....O. M. Morse  
 Dust-collector.....L. Walder  
 Dust-guard. Automatic.....R. H. Nyland et al  
 Dye. Black surfur.....B. Priebs et al  
 Egg-case. Portable.....J. H. Lyday  
 Egg-storing tray.....J. A. and G. Lyons  
 Electric cable.....G. H. Nisbett  
 Electric-conductor crossing. Suspended.....J. Floyd  
 Electric-conductor switch. Suspended.....J. Floyd  
 Electric lock.....H. G. Carleton  
 Electric motor.....E. G. P. Oelschlaeger et al  
 Electric-motor brake.....C. A. Lindstrom  
 Electric-motor-starting device.....J. H. F. Gorges  
 Electrical battery.....C. E. O'Keenan  
 Electrical-distribution system.....E. E. Frischmuth  
 Electrically-driven machine.....T. H. Joseph et al  
 Electrolytic cell.....J. Hargreaves  
 Electrolytic cells. Cathode for use in.....J. Hargreaves  
 Elliptic spring.....C. I. Dupont  
 Engine igniter. Explosive.....L. Witry  
 Engine-starting device. Explosive.....R. R. von Paller  
 Engine vaporizer. Gasoline.....J. G. MacPherson  
 Engines. Electric spark for gasoline.....J. G. MacPherson  
 Engines. Fuel-receptacle for gasoline.....G. L. Reenstierna  
 Engines. Oil-separating apparatus for steam.....L. A. Cooper  
 Envelop safety-fastener.....T. Hawkins  
 Excavation. Apparatus for constructing lines of.....W. D. Washington  
 Excavator. Steam.....D. R. French  
 Exercising apparatus. Electric conductor for.....A. M. Crooker et al  
 Exhibition structure.....H. F. W. Lyons  
 Explosive-engine. Rear-compression.....H. A. Berthean  
 Extension-platform.....G. E. Seymour et al  
 Eyeglasses.....H. G. Chase  
 Eyeglasses or spectacles.....J. Vilanch  
 Faucet and filler for receptacles.....H. J. Valentine  
 Faucet attachment. Bottle.....H. A. Knight  
 Feed-rack.....J. Morris  
 Feed-trough for horses.....G. E. Combs  
 Fence-post.....L. K. Forsythe  
 Fence-post.....J. G. Robinson  
 Fence-weaving machine. Wire.....A. E. Blashill  
 Fence. Wire.....P. A. Reid  
 Fertilizer-distributor.....E. Oubre  
 Fifth-wheel. Vehicle.....J. G. MacPherson  
 File. Letter.....I. E. Rockwell  
 Film drier. Roll.....C. W. H. Smithers  
 Fire-extinguisher.....J. Braunwalder  
 Fireproof-arch center.....G. B. Walte  
 Fishing-pole attachment.....F. J. Ditchey  
 Flue.....W. A. Gay  
 Flue-scraper.....L. V. Tucker  
 Fluid heating and sterilizing apparatus.....A. G. Waterhouse et al  
 Forges. Blast-producing apparatus for.....N. Tingley  
 Fuel. Artificial composite.....M. C. Fitts et al  
 Fuel. Producing artificial.....W. P. Taggart  
 Furnace.....R. Schorr  
 Furnace fuel-feeder.....F. N. Spear  
 Furnace-grate.....H. Truesdell  
 Fuse-block.....L. A. Keith  
 Game or toy.....E. H. Allison  
 Gas-burner.....J. E. Tatham  
 Gas-engine.....E. C. Wood  
 Gas generator. Acetylene.....A. C. Einstein  
 Gas generator. Acetylene.....I. L. Harris  
 Gas generator. Acetylene.....J. Lawrence  
 Gas generator. Acetylene.....J. W. Lawrence  
 Gas generator. Acetylene.....E. F. Smith  
 Gas generator. Acetylene.....C. Verwer  
 Gas generators. Pressure safety device for acetylene.....F. H. Harlman  
 Gas-meter. Prepayment.....E. F. Griffiths  
 Gate.....J. F. Glidden  
 Gate.....J. N. Salmon  
 Glass or vitreous pipe or tubular bodies. Apparatus for forming.....T. B. Howe et al  
 Glass prism-plate.....G. Fngman  
 Glass. Prismatic rolled sheet.....C. C. Hartung  
 Glue-heater.....F. N. Hastings  
 Glue-spreader.....C. E. Francis  
 Grain-drill.....S. Belanger  
 Grain-drill attachment.....W. Falconer  
 Grain-mill machine. Plate.....G. Wishart  
 Gramophone sound-box.....G. K. Cheney  
 Grating. Safety.....H. W. Kingsbury  
 Grip. Friction.....H. M. Sackett  
 Gun attachment.....W. Pell et al

Guns. Level-quadrant for high-elevation.....J. Kurlig  
 Hair. Device for promoting growth of.....F. W. Evans  
 Handpiece.....C. C. Lusby  
 Hand-rest.....F. H. Thier  
 Handle-bar. Adjustable.....G. P. Rishel  
 Harness-rossette.....J. E. Pduerger  
 Heat or cold. Electrical detector for.....J. O'Meara  
 Heater-shield and ventilator. Combined.....A. B. Shantz  
 Hinge.....L. Bader  
 Hinge.....H. R. Clark  
 Hop bleaching and drying kiln.....J. Dowdell et al  
 Horseshoe. Soft-tread.....W. M. Kennedy et al  
 Hose.....J. F. McGuire  
 Hose-supporter.....O. H. Hake  
 Humidifier.....R. C. Ulbrich  
 Hydraulic elevator.....G. H. Evans  
 Ice-cream freezer.....J. A. E. Anderson  
 Impact-motor.....W. H. Pfeiffer  
 Journal-bearing.....W. T. Lee et al  
 Key-seating machine.....A. D. Catlin  
 Kitchen utensil.....H. Wieser  
 Knife-guard.....W. J. Stewart  
 Ladder. Extension.....A. T. Kingsley  
 Lamp. Acetylene-gas.....G. A. Moore  
 Lamp. Electric-arc.....J. F. Ackermann  
 Lamp. Electric-arc.....J. S. Nowotny  
 Lamp. Electric-arc.....T. Spencer  
 Lamp. Hydrocarbon.....W. G. Bird  
 Lamp-socket.....C. H. Dressel  
 Lamp. Vapor.....V. A. Menuez  
 Lantern. Tubular.....F. Dietz  
 Last. Transversely-divided boot or shoe.....A. D. Tyler, Jr  
 Lease-forming mechanism.....A. E. Rhoades  
 Level.....S. M. Combs  
 Life-preserver.....E. K. Roden  
 Liquids. Apparatus for separating solid bodies from.....D. Gale  
 Liquids with gas. Apparatus for charging.....J. Schneible  
 Lithographic work. Reduction-frame for.....F. J. Kallenbach  
 Lock.....T. Churchill  
 Lock and latch. Combined.....M. E. Collins  
 Locomotive.....H. A. Luttgens  
 Log-dogging apparatus.....T. J. Neacy  
 Loom.....7 pats. W. H. Baker et al  
 Loom.....A. Morell  
 Loom automatic controlling mechanism.....W. H. Baker et al  
 Loom warp stop-motion.....W. H. Baker et al  
 Lubricator and piston-rod packing.....W. B. Erh  
 Magnetic separator.....C. F. Courtney et al  
 Mail-crane. Railway.....A. R. Black  
 Mattress-stuffing machine.....H. C. Rehkopf  
 Measuring instrument.....F. Schrotke  
 Measuring instrument for lasts, &c.....C. B. Hatfield  
 Mercerizing apparatus.....W. G. Denn  
 Metal box.....W. H. Moore  
 Metal-cutting machine.....S. J. Vernsten  
 Metal structures. Forming composite.....W. H. Savery  
 Metal-working machine. Combined.....R. Bates  
 Meter.....C. O. P. Schrotke  
 Mica, &c. Assorting apparatus for sheets of.....R. W. Heard et al  
 Milking machine. Cow.....M. M. Condron  
 Mill-frame.....A. M. Zimmerman  
 Mineral waters. Apparatus for purifying natural.....J. Z. Formel  
 Mining-drill.....J. Wynne et al  
 Mitering-machine.....2 pats. J. L. Tyler  
 Moistening or damping device.....E. Caverly  
 Motor-starter.....E. M. Fraser  
 Mower or harvester finger-bar attachment.....W. Gattermann  
 Muscle-kneader.....R. Hollem  
 Needle. Tape.....M. N. Esterbrook  
 Obstetrical appliance.....H. Olson  
 Oil-cake-trimming machine.....A. W. French  
 Oil extracting.....C. Erisman  
 Oil for vehicle-wheels. Automatic.....V. D. Roe  
 Oils. Refining mineral.....T. Macalpine  
 Ore-crusher.....T. Smith  
 Ore mixer and sampler.....J. M. Damm  
 Ores anhydrously. Concentrating.....2 pats. S. M. Lissau  
 Ores anhydrously. Means for concentrating.....2 pats. S. M. Lissau  
 Organ.....J. Wyvell  
 Package making and filling machine.....J. R. Okell  
 Packing-case. Collapsible.....P. F. Kesting  
 Packing. Piston.....M. F. Cox  
 Paper box and blank therefor. Folding.....J. A. Scott  
 Paper-box-making machine.....W. S. Davis  
 Paper-feeding machine.....T. C. Dexter  
 Paper, &c. Mechanism for feeding sheets of.....H. Bilgram et al  
 Peanut-blanching machine.....W. Simpson  
 Pen. Drawing.....J. M. Dannheiser  
 Pen filler. Fountain.....W. W. Robbins  
 Pen. Fountain.....H. J. Upton  
 Petroleum or gas motor. Multiple-piston.....C. E. Calloeh  
 Phonograph. Magazine.....G. V. Gress  
 Phonographic reproducing device.....T. A. Edison  
 Photographic recording apparatus for vibratory rays of light.....A. Pollak et al  
 Piano-action.....W. R. St. Clair  
 Piano-pedal.....W. M. Bauer  
 Pick-point.....J. Aegerter  
 Picture-frame.....A. F. Messinger  
 Pile fabrics. Device for cutting double.....W. Fischer, Sr., et al  
 Pinking-cutters. Forming.....H. A. Hannum  
 Pipe-bending mechanism.....J. A. Miller  
 Pipe-coupling.....G. B. Cushman et al  
 Pipe-joint. Swivel.....C. W. Vaughan  
 Pitch or tuning pipe.....J. Oefinger et al  
 Pitman connection.....E. Jones  
 Planter. Automatic check-row corn.....2 pats. J. B. Jarmin  
 Planter. Corn.....E. G. Johnson  
 Planter. Potato.....J. Shearer et al  
 Plow. Orchard.....T. Seanlon



Plow-point wear-tip.....J. B. Wilson  
 Plow, Wheel.....L. P. Graham  
 Power-transmitting mechanism.....E. Winans  
 Printing-machine.....3 pats. W. Scott  
 Printing-press inking attachments, Job.....  
 Printing-press insetting attachment.....  
 Pump cut-off, Duplex-steam.....J. Gaskell  
 Pump-rod bushing.....G. H. Cushing  
 Pumping-engine.....C. L. Heisler  
 Punching-machine.....A. Cruickshanks  
 Punching, stamping, &c. Machine-tool for.....  
 Quilting-frame.....A. D. Moyer  
 Rail-joint.....A. A. Rely  
 Railway, Electric.....W. B. Purvis  
 Railway-switch.....A. G. Moeckel  
 Railway tongue-rail fastening.....P. Knittel  
 Railway-track structure.....H. B. Nichols  
 Range-boiler and making same.....  
 Reclining-chair and clothes-rack, Combined.....  
 Register.....J. G. Webb  
 Register.....J. A. Brynie  
 Revolving chair.....J. Ellenbecker  
 Road breaking and gouging machine.....  
 Road making and repairing machine.....  
 Roller and harrow, Combined.....N. Schwartz  
 Rolling-mill roll-relieving device.....  
 Rope transmission device.....O. Sundt  
 Rotary engine.....2 pats. L. A. Cooper  
 Rotary engine, Compound.....G. Code  
 Rubber fabrics, Tool for repairing.....  
 Sack-cleaning machine.....C. P. Gifford  
 Sack-cleaning machine.....F. Mueller  
 Sash-cord fastener.....J. F. Collins  
 Sash-holder.....J. Bohlen  
 Saw guide and support, Drag.....  
 Scale, Computing.....T. A. Killman  
 Scale, Postage.....C. F. Richey  
 Scholar's companion.....C. Schneider  
 Screw Jack.....W. O. Derry  
 Seeder.....J. T. Fitzgerald et al  
 Separable chair.....L. S. Hayes  
 Serving apparatus.....W. C. Church et al  
 Sewing and cutting machine, Buttonhole.....  
 Sewing and cutting machine, Buttonhole.....  
 Sewing-machine ruffling attachment.....  
 Sewing-machine slack-thread controller.....  
 Sewing on flat buttons, Machine for.....  
 Shaft and bearing, Crank.....J. C. Robbins  
 Shaft-hanger.....D. R. Wing  
 Shirt-waist holder and skirt-supporter.....  
 Shoe-horn.....R. B. Lamb et al  
 Shutter-worker.....E. J. Randall  
 Sign.....H. K. Whitecomb  
 Sign or signal for calling cabs.....  
 Sign.....A. G. R. Nichol  
 Silo.....J. Todd  
 Skate, Roller.....O. W. Everett  
 Smoke-consuming device, Furnace.....  
 Snap-hoop.....G. S. Gallagher  
 Sound recording and reproducing machine.....  
 Speed mechanism, Variable.....  
 Spiffoon, Fountain.....G. H. Treadgold  
 Spooling-machine.....2 pats. C. F. Foster  
 Spring-seat.....W. Borchert  
 Spnr.....C. D. Jackson  
 Stamp, Hand.....L. K. Scottford  
 Steam-generator.....R. Ramsden  
 Steam-generator, Sectional.....S. E. Light  
 Steam-generator, Sectional.....C. W. Newton  
 Steam-separating trap.....J. R. Cox et al  
 Stove-shelf.....F. K. Chase  
 Superphosphates, Making.....H. Saxl  
 Suturing instrument.....L. Bramson  
 Swaging-machine.....J. E. Halifax  
 Syringe.....F. J. Lander  
 Syringe, Vaginal.....A. Arlt  
 Table-leg fastener.....S. M. Smyth  
 Table-mat.....W. W. Robinson  
 Tap.....G. Stroh  
 Tap, Beer.....J. Mohn  
 Tapping apparatus, Liquid.....H. Engel  
 Tar esters of fatty acids and making same.....  
 Telegraphic transmitter and receiver.....  
 Telephone apparatus.....A. C. Crehore et al  
 Telephony, Multiple.....E. A. Faller  
 Temperature-indicator, Electric.....  
 Tentering-machine clip.....L. S. Wilder  
 Thread-tier.....F. I. Dana  
 Ticket book, Coupon.....G. C. Wadleigh  
 Tidal force, Means for utilizing.....  
 Tie-plate.....P. Boisrame  
 Time-recorder.....W. Goldie  
 Tin for inclosing preserved provisions, foods, &c.....A. W. Maconochie  
 Tire fastening, Pneumatic.....J. A. Berger  
 Tire separator.....D. J. Lahay  
 Tire valve, Pneumatic.....E. W. McCaslin  
 Tire, Vehicle.....J. E. Van Nest  
 Tires to vehicle-wheels, Means for securing rubber.....  
 Tobacco artificially, Apparatus for curing.....  
 Tobacco-softening machine.....D. J. Ely  
 Tongue, Household.....J. K. Proctor  
 Tool, Combination.....T. F. Smythe  
 Tooth-crowns, Making separable matrices for seamless.....S. C. Snyder  
 Toy, &c. Spring-actuated mechanical.....  
 Track-sanding device.....F. J. Gustine  
 Traction-engine.....G. W. Mudd  
 Truck bearing, Car.....G. Adamson  
 Truck bearing, Car.....C. H. Hartman  
 Truck frame, Car.....G. L. Stuebner  
 Truss, Hernal.....E. S. Woods  
 Truss, Hernal.....R. W. Browne  
 Truss, Hernal.....H. M. Johnson  
 Truss-pad.....A. J. Davidson  
 Truss, Pile.....D. L. Garver

Truss, Umbilical.....H. C. Rash  
 Tubing, Metallic.....T. Midgley  
 Turbine ring of blades, Steam.....  
 Turn-tables, Pivotal bearing for.....O. Hoff  
 Turning backstays, Device for.....  
 Tyer.....R. C. Schemmel  
 Type-writer, Telegraphic.....W. A. Thomas et al  
 Type-writing machine.....J. O. Fowler, Jr  
 Valve.....C. Gulland  
 Valve-gear.....W. M. Musgrave  
 Valve, Rotary cut-off.....L. A. Cooper  
 Valve, Steam-actuated.....W. A. Woodson  
 Valves, Diaphragm for pressure-regulating.....  
 Vehicle, Autotruck.....A. W. Cash  
 Vehicle, Autotruck.....J. C. Anderson  
 Vehicle-brake.....M. E. P. Chabouche  
 Vehicle, Motor.....J. T. Doughe  
 Vehicle motor-frame attachment.....  
 Vehicle steering mechanism.....L. E. Brookes  
 Vehicles, Safety device for electric.....  
 Velocimeter, Marine.....F. E. Case  
 Vending-machine, Coin operated.....J. Grice  
 Veterinary obstetrical instrument.....  
 Violin.....J. Markus  
 Wagon, Dumping coal.....L. H. Hall  
 Walls and ceilings, Construction of.....  
 Walls, &c. Facing for.....A. Wohlgenuth  
 Warping-machine.....C. Slingland et al  
 Washing-machine.....G. W. Bolton  
 Washing-machine.....L. L. Kellogg  
 Washing-machine.....H. E. Smith  
 Water-bag.....L. M. Hansen  
 Water-closet-flushing apparatus.....  
 Water-closet valve.....A. La Bonte  
 Water-heating apparatus.....H. T. C. Heuck  
 Wind-wheel.....W. Roehltitz  
 Wind-wheel.....T. O. Perry

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Advertising device.....P. E. White  
 Air-compressor, Hydraulic.....J. W. Van Brocklin  
 Air-pipe coupling, Automatic.....J. W. Spurlack  
 Annunciator.....W. M. Davis  
 Arm rest or support.....L. C. Neal  
 Automobile.....F. G. Frankenberg  
 Automobile vehicles, Power mechanism for.....  
 Axle-swaging apparatus.....E. E. Allyn et al  
 Axle-swaging apparatus.....J. Miller  
 Back-pedal brake or coaster.....J. N. Parks  
 Back-pedal brake.....E. E. Ziegler  
 Baking-pan.....J. F. Meredith  
 Bale-tie.....L. R. Lantz  
 Baling-press.....G. Taylor  
 Barrel-cap holder.....A. S. Richardson et al  
 Bath-cabinet.....L. L. Cahoon  
 Battery plate, Secondary.....J. B. Conrad  
 Battery receptacle, Secondary.....  
 Bearing, Shaft thrust.....J. Middleby, Jr  
 Bed or crib, Folding.....E. G. Hoffmann  
 Bed, Spring.....J. P. Balser  
 Bed, Spring.....W. F. Ade, Jr  
 Bicycle.....A. Prager  
 Bicycle.....W. C. Dunn  
 Bicycle-pump.....O. Keen  
 Bicycle-pump.....W. M. Reason  
 Bicycle-support.....O. Weston  
 Billiard-cue tip.....J. Prince  
 Boat, Life.....P. U. Riess et al  
 Boiler blow-off, Steam.....C. R. Partington  
 Boiler furnace, Steam.....J. Thurell  
 Bolster, Collapsible.....J. E. Long  
 Book, Account.....E. Mayer  
 Book, Manifold sales.....D. B. Kearney  
 Book, Separable.....2 pats. Reissue  
 Boring-tool brace-head.....F. H. Gilson  
 Bottle, Tool brace-head.....A. Weisenhorn  
 Bottle carrier, holder, or hanger, Claw.....  
 Bottle, Non-refilling.....C. A. Law  
 Bottle or similar receptacle.....J. A. Walber  
 Bottle-washing machine.....J. O'Connor  
 Box machine, Honey.....F. Luviel  
 Box machine, Honey.....C. Mondeug  
 Brake-application valve for train pipes.....  
 Brake mechanism, Differential.....J. J. Sullivan  
 Brick-mold-sanding machine.....J. A. Brill et al  
 Brick-mold-sanding machine.....H. Schoonmaker  
 Brick-press.....C. M. Steele  
 Bridge-bit.....M. H. Sims  
 Brush.....L. Roth  
 Brush-holder.....H. F. T. Erben et al  
 Buggy-top attachment.....H. C. Stockton  
 Buggy-top raiser.....J. C. Ford  
 Building-block.....W. A. Johnston  
 Burglar-alarm.....J. W. Rough  
 Cables, Manufacture of chain.....J. Verity  
 Calcium, &c. Producing carbide of.....  
 Can-opener.....W. S. Horry  
 Canopy-frame.....2 pats. C. Kempf  
 Canopy-support.....J. T. Johnson  
 Canteen.....J. T. Johnson  
 Car-coupling.....W. Lanz  
 Car-coupling.....J. F. Beckholts  
 Car-coupling.....R. P. Norton  
 Car, Factory.....W. Cressley  
 Car, Grain.....G. Douglas  
 Car-loader.....J. L. Roberts  
 Car, Parlor compartment.....J. B. Strauss  
 Car-replacer.....J. D. Hoover  
 Car-roof.....D. C. Ross  
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Curtain-pole.....K. R. Broadstreet  
Cutter mechanism. Lever-operated.....W. O. Orr  
Cycle-seats. Wire mesh for.....A. E. Wale  
Cyclometer attachment.....A. F. Rockwell  
Dental Cabinet.....C. H. Lind  
Dental root-causal drier.....D. Perry  
Dish-mold.....J. Cook  
Dispensing-can.....F. R. McIntyre  
Display and advertising device. Window.....A. Y. Moorefield  
Dock. Dry.....F. C. Lang  
Door-check. Pneumatic.....E. H. Harrison, et al  
Dough-mixing machine.....J. R. Farmer  
Draft-equalizer.....T. I. Brinkley et al  
Draft-elevator. Gang-plow.....R. C. McCormick  
Dredge anchoring device.....R. R. Osgood  
Dredging apparatus. Hydraulic.....W. J. Bradley  
Dredging-bucket.....C. H. Smith  
Dress-shield fastener.....J. W. Stevens  
Drill-grab.....G. I. Lewis  
Drill-shaft. Telescopic.....I. N. and W. J. Cassidy  
Drill spreading, truing, and gauging machine.....D. G. Morgan  
Drum. Heating.....M. and A. E. Kennedy  
Dry closet.....R. E. L. Jamney  
Dust-separator.....T. Lee  
Ears. Sound-collector for the.....W. G. Ehrhardt  
Educational system.....A. E. Osborne  
Electric controller.....C. J. Reed  
Electric generating apparatus.....J. H. Bickford  
Electric-light cord-adjuster.....F. H. Stewart  
Electric-motor controller.....T. S. Perkins  
Electrical conductor pipes or conduits. Manufacture of.....A. H. Howard  
Electrical connections. Conifer of wires for.....C. F. Ash  
Electrical contact parts. System of non-interchangeable.....M. Froschl et al  
Electrical currents. Controlling.....A. B. Holmes  
Electrical-distribution system.....W. J. Davis, Jr.  
Electrical-distribution system.....H. F. Roach  
Electricity-meter.....G. Hookham  
Electrolytic apparatus.....G. Loiselet  
End-gate.....A. E. Beall  
End-gate. Wagon-body.....W. Chater  
Engine operating and governing means.....C. Robinson  
Engines. Apparatus for lining.....C. H. Hopkins  
Extension-table.....C. Horn  
Eyeglass-guard.....B. P. Currier  
Eyeglasses.....L. W. Bugbee  
Eyeglasses.....P. H. Flowers  
Eyeglasses.....H. F. Sanger  
Fastening device and padlock.....J. T. Dufau  
Feeder for stock. Salt.....D. Frese

Fence.....G. M. Beerbower  
Fence-post.....W. L. Penney  
Fertilizers. Apparatus for making.....J. F. Bussells  
Fifth-wheel.....C. L. Townsend  
Filling-machine.....H. A. White et al  
Filter.....J. Posch  
Filter.....J. Schinneller  
Filtering material.....N. Lanser  
Fire-escape.....T. T. Brown  
Floor-covering.....2 pats.....E. Berliner  
Fluoro-hydrocarbon. Aromatic.....F. Valentiner  
Fly-catcher.....G. Senior  
Folding box.....H. M. Hoover  
Folding chair. Portable.....A. L. Levin  
Furnace hoisting apparatus. Blasting.....W. Kennedy  
Furnaces. Oil and gas burner for.....J. Tyler  
Furniture. Upholstered.....J. B. Conrad  
Galvanizing apparatus.....3 pats.....E. I. Braddock  
Garbage-burner. Domestic.....C. R. Harris  
Garment-stretcher.....J. Miotke  
Gas-burner-igniting device.....C. L. Burger  
Gas-burner. Self-igniting.....R. Beece  
Gas. Composition of matter for making.....C. H. Worsnop  
Gas-engine. Multiple-cylinder.....R. A. Frisbie  
Gas generator. Acetylene.....W. H. Mitchell, et al  
Gas-purifying apparatus.....E. J. Duff  
Gate.....S. O. Campbell  
Gate.....H. F. Condon  
Gate.....W. A. Whitcomb  
Gear-cutting machine.....J. Soumerai  
Geared wheels. Machine for cutting teeth of.....H. Bilgram  
Gin. Saw.....B. F. McGaw  
Gin-saw cleaner.....B. F. McGaw  
Glass. Apparatus for producing wire.....J. Locke  
Glass-bottle-blowing machine.....2 pats.....L. Grote  
Glass bottles. Making.....L. Grote  
Glass. Manufacture of wire.....J. Locke  
Glass-mold.....H. W. Heerdt  
Gloves, &c. Fastener for.....W. S. Richardson  
Gold and silver ores. Treating.....H. Hirsching  
Gong. Alarm.....J. A. Brill  
Grading machine. Road.....R. E. Burke  
Grain-shocking machine.....T. A. Wooley et al  
Grainulating-machine.....A. R. Morris  
Grapple.....W. S. Holcombe  
Grindstone.....W. H. Clapp  
Hair-fastener.....C. Starz  
Hair, &c. Mixing-machine for.....G. Berbrugger  
Hammock.....M. P. Fishburn  
Harness-support.....W. R. Hewitt  
Hat-pouncing machine.....G. F. Larkin  
Hatchet. Metallic.....J. R. Payson, Jr.  
Haulage-clip.....J. W. Smallman  
Hay-loader.....A. E. Smith  
Hay-rack.....A. Ferguson  
Hinge-lock.....H. M. Bayly  
Holeback.....H. Shibley  
Hose connection.....E. Gunnell  
Huller.....F. W. Fee  
Hydraulic brake.....F. L. Clark  
Ice. Apparatus for manufacturing coreless can.....W. Roettinger et al  
Ice-cutting vehicle.....J. C. Green  
Incubator.....J. S. Stewart  
Ingot-extracting apparatus.....W. H. Morgan et al  
Ironing-machine.....G. G. Place  
Irrigating water-gate.....W. H. Kiler  
Jar or bottle closure.....H. A. Hughes  
Knife.....J. Hirsch  
Knitting-machine.....M. J. Fisher  
Knitting-machine.....E. J. Franck  
Knitting-machine.....J. A. Ricard  
Knitting-machine.....J. E. Rowe et al  
Knitting machine stop-motion. Circular.....W. F. West et al  
Lamp-burner.....F. T. Williams  
Lamp. Oil-gas.....2 pats.....A. S. Newby  
Lamp. Street.....A. E. Shaw  
Lamp-supporting bracket for desks. Electric.....S. S. Porter  
Lamp. Vehicle.....G. Schmidt  
Land-roller.....A. W. Acker  
Lantern attachment.....T. M. Crepar  
Lathe.....W. L. Cheney  
Leather-stretching machine.....F. A. Bradford et al  
Liquid. Apparatus for charging receptacles with measured quantities of.....H. Strater  
Lock-controlling device.....H. G. Carleton  
Locomotive buffer-beam.....2 pats.....J. F. Dunn  
Loom.....W. H. Baker et al  
Loom.....H. Wyman  
Loom harness attachment.....P. Cassidy  
Loom. Lappet.....2 pats.....J. R. MacColl  
Loom shuttle-check.....W. F. Draper  
Loom shuttle-driving mechanism.....E. Suter  
Loom warp-beam.....J. Betsch  
Loom warp stop mechanism.....W. H. Baker et al  
Low-water alarm for steam-boilers.....S. L. Moyer  
Lubricator feed-valve.....G. S. Webster  
Mail-bag closure.....J. W. Fairfax  
Manholes. Device for excluding water from.....R. Herman  
Manure and seed distributor.....R. Schulte-Blome  
Match-box.....J. G. Locke  
Mercurizing apparatus.....J. F. Copley et al  
Metallic tube.....L. F. Betts  
Mine safety device.....D. McCowan  
Mining dog. Self-acting.....W. A. Wilson  
Mining-machine.....J. L. Mitchell  
Mold and press. Combined.....J. J. Brannagan  
Mold for cement curbs and gutters.....E. W. Seamans  
Molding-machine.....J. W. Murray et al  
Mordanting, &c. Apparatus for.....T. R. Bottomley et al  
Mowing-machine.....J. Macphail  
Mowing-machine knife.....A. C. McCoy  
Mowing-machine seat.....N. Baughman  
Music-holder.....L. C. Schaffer et al  
Necktie-fastener.....A. L. Shantz  
Nerve-broaches, &c. Machine for manufacturing.....J. H. Downie  
Nut-lock.....H. E. Downing et al  
Nut-lock.....J. D. Marshall et al



Oil-can.....D. True  
 Oil-extracting apparatus.....E. Donard  
 Oiler. Cross-head-pin.....W. A. Harvey  
 Optical device.....G. F. Appleton  
 Ores for recovery of metallic ingredients.  
 Treating.....B. Sadtler  
 Ores or tailings. Leaching.....E. H. Dickie  
 Packing-ring. Piston.....2 pats.  
 Paper-holder.....W. H. Myers  
 Pad-holder.....G. A. Edwards  
 Pan-lifter.....E. Hudson  
 Paper bag.....M. D. Polhemus  
 Paper-feeding machine.....2 pats.  
 Paper-feeding-machine feed-rolls.....T. C. Dexter  
 Paper vessel.....H. Bilgram  
 Pasting-machine.....J. N. Davis  
 Pea sheller and thresher.....J. H. Farr et al  
 Percolator. Coffee-pot.....C. A. Sichel  
 Permutation-lock.....H. A. Alm  
 Phonograph erasing device.....R. Nelles  
 Pick.....W. P. Bevington  
 Picture-frame.....R. Cariton  
 Pictures, stationery, &c. Holder for.....W. H. H. Dickinson  
 Planter. Cotton-seed.....M. P. Scott  
 Pliers.....H. A. Deiters et al  
 Plow.....C. R. Davis  
 Plow attachment.....G. A. Flanders  
 Plow-clip.....W. H. Curd et al  
 Plow seeding attachment.....F. Flich et al  
 Potato separator and cleaner.....W. J. Martin  
 Power-transmitter.....G. P. Smith  
 Printing-machine. Bed-and-cylinder.....L. C. Crowell  
 Printing machine. Box.....J. F. Ames  
 Printing machine. Oil-cloth.....W. T. Wiegand  
 Propellers upon their shafts. Means for securing ship's screw.....J. W. Fowler  
 Pulley.....C. H. Bicalky  
 Pumping mechanism. Turbine.....F. Marburg, Jr  
 Rail-joint.....D. Stephens  
 Rail-joint.....B. Sturenberg  
 Rails. Device for preventing creeping of.....J. L. Pope  
 Railway-brake. 2 pats.....H. H. Westinghouse  
 Railway system. Electric.....G. L. Campbell  
 Railway system. Electric.....L. E. Watkins  
 Range. Gas and coal.....H. R. Sheppard  
 Refrigerator-car.....T. B. Kirby  
 Reservoir filler-cap.....E. Meredith  
 Resins. Compound for dissolving.....F. G. Kleinstuber  
 Rhodolalkyletherester.....A. Schmidt  
 Riveting apparatus.....J. J. Tynan et al  
 Rubber type.....J. S. Duncan  
 Rubber type. Mold for making.....J. S. Duncan  
 Ruler. Accountant's.....C. O. Meux  
 Sash-cord fastener.....A. H. Fisher  
 Sawing machine. Wood.....T. S. Carroll  
 Sawmill.....L. W. Dickey  
 Scaffolding.....J. T. O'Brien  
 Scale. Computing.....A. B. Hayden  
 Scraper.....M. Mullin et al  
 Screw-jack. Adjustable.....J. C. F. Long et al  
 Seat structure.....W. L. Schellenbach  
 Sewing button to fabrics. Machine for.....J. T. Hogan  
 Sewing-machine feller.....J. T. Saaw  
 Sewing-machine looper mechanism.....H. C. Peters  
 Sewing-machine power-transmitter.....W. McHaffie  
 Sewing-machine. Ruffing.....2 pats.  
 Sewing-machine work-clamp. Buttonhole.....W. N. Parkes  
 Shade-roller fixture.....J. E. Darby et al  
 Shade-roller. Spring.....E. F. Hartshorn  
 Shafting and pulley collar.....W. McCabe  
 Shafts. Means for maintaining a given direction of rotation of.....H. F. Roach  
 Shank-stiffeners. Machine for fastening.....J. H. Fassett et al  
 Shoe. Cushion.....A. Reed  
 Signaling apparatus.....C. R. Perrine  
 Silicon and hydrogen. Compound of.....C. B. Jacobs  
 Skirt-holder.....J. Revel  
 Skirt-hanger.....L. M. Smith  
 Snap-hook.....C. A. Whitney  
 Sodium-carbonate crystals. Making.....J. Kunstner  
 Spinning-frame separator.....C. E. Tefft  
 Stamp and court-plaster receptacle. Combined.....E. K. Lathrop  
 Steel building construction. &c. Clip for.....2 pats.  
 Stereoscope.....J. O. Boden  
 Stereotype-plates. Manufacture of.....F. J. Wendell  
 Stone. Producing artificial.....E. J. Seymour  
 Stove.....C. H. Seaman  
 Stove heating attachment.....A. B. Vedder  
 Street-sweeper.....A. Piton  
 Stud.....G. R. Clarke  
 Summation-meter.....J. Harris  
 Swing. Portable.....G. G. Mead  
 Switch.....E. W. G. C. Hoffmann  
 Switch-lock.....H. D. Miles  
 Telephone-switchboard.....M. I. Baird  
 Telephone-switchboard.....M. I. Baird  
 Telephone-switchboard apparatus.....T. C. Wales, Jr  
 Tilting table or chair.....H. G. Leisenring  
 Tire-spreader.....C. E. Thurlow  
 Tire fastener. Vehicle.....J. R. Colt  
 Tire inner tubes on mandrels. Apparatus for placing pneumatic.....S. S. Miller  
 Tire-tightener.....J. L. Ham  
 Tobacco-separating machine.....L. R. Scholtz  
 Tool-handle.....L. Grote  
 Tooth. Artificial.....B. Robinson  
 Tooth. Detachable artificial.....R. E. Campbell  
 Toothpick.....G. W. Schellenbach  
 Torpedo. Electrically-operated submarine.....P. C. F. Hoffmann  
 Toy drum.....M. E. Converse  
 Track-sander. Locomotive.....H. L. Leach  
 Trap-setting device.....A. Generous  
 Tread-power.....T. D. Dersheimer  
 Tricycle for land, water, and ice. Combination.....T. Richmond  
 Trimming. Garment.....R. G. Marsh  
 Trolley-wheel.....H. A. Osborne  
 Truck. Antivibrating car.....L. C. Thompson et al  
 Truck. Hauling.....F. W. Fritz  
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Trunk.....G. V. Hossfeld  
 Tube-cleaning apparatus.....W. S. Elliott  
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 Tug. Hame.....W. H. Cessna  
 Turbine. Reversing steam.....C. A. Parsons et al  
 Twine-tension device.....W. S. Sherd  
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 Type-holder.....J. S. Duncan  
 Type-writing machine.....W. J. Barron  
 Type-writing machine.....T. Cahill  
 Type-writing machine.....R. J. Fisher  
 Valve and muffler. Safety.....W. E. Wood  
 Valve. Fluid-discharge.....I. D. Perry et al  
 Valve for motive-fluid tools. Throttle.....C. H. Johnson  
 Valve for pneumatic pillows, &c.....G. H. F. Schrader et al  
 Valve. Gas-engine governor.....J. W. Lambert  
 Valve-gear. Engine.....A. W. J. Best  
 Valve. Safety.....E. A. and W. E. Wood  
 Vault-light.....R. M. Cox  
 Vehicle-brake.....J. W. Rogers  
 Vehicle. Motor.....P. J. Collins  
 Vehicle. Motor.....J. W. Eisenhuth  
 Vehicle. Motor.....W. Scott  
 Ventilator.....O. H. Champagne  
 Vessel. Marine dumping.....F. H. Bullis  
 Visible and audible signal. Combined.....E. W. Vogel  
 Wagon-bed side-board fastener.....S. R. Zimmerman  
 Wagon-brake.....J. Wheeler  
 Wagon gear. Spring.....S. F. Parson  
 Wall-plug.....J. G. McDowell  
 Wall-tie.....J. G. McDowell  
 Watchmaker's tool.....C. A. Bassett  
 Water by compressed air. Apparatus for raising.....J. Petermann  
 Water-clarifier. Centrifugal.....F. H. Richardson  
 Water-deaerating apparatus.....G. H. Kleucker  
 Water-purifying apparatus.....H. Stillman  
 Water-tube boiler.....W. L. Jancey  
 Water-wheel governor.....C. P. Bradway  
 Wax holder and feeder. Burnishing.....E. H. McAlle  
 Wax holder. Sealing.....G. H. Goebel  
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 Wells. Improving mineral.....J. C. Minor  
 Wheel for casters, &c.....W. Livingstone  
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 Wool. Removing solvent vapors from.....E. Donard  
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 Yoke-center-locking device. Neck.....C. F. Deplanty  
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 Baling-press.....C. Dodge  
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 Battery-box.....L. W. Pullen  
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 Boiler-cleaner.....P. A. Doughty  
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 Bottle fastener. Elastic milk.....J. B. Kimber  
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 Bottle-stopper.....C. Marchand  
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 Caisson.....W. H. McFadden  
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 Capo tasto.....T. M. Pletcher  
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 Car-coupling.....W. E. Alexander  
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 Circuit-breaker.....E. Thomson  
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 Corset-cover.....H. G. Steely  
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 Coupling for vehicles, wagons, &c.....B. K. Thomas  
 Cover for cooking utensils.....C. H. Pimlott  
 Crank-pins and eccentrics. Quartering and turning machine for.....L. H. Morgan  
 Cross-tie and rail-fastening. Metallic.....A. B. Allen  
 Cue-tip.....T. Rominger  
 Cultivator.....L. C. Young  
 Current generator. Alternating.....C. S. Bradley  
 Curtain-fixture.....H. M. Stevenson  
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 Cushion filling and shaping device.....F. L. Myers  
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 Damper-regulator and ventilator. Combined.....F. L. King  
 Dental impression-cup.....H. D. Osgood  
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 Door.....J. M. Leaver  
 Door.....J. M. Leaver  
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 Draft-regulator.....W. B. Fowler  
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 Electrical-distribution system.....A. D. Lant  
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 Electrical purposes. Treating porous material used for.....W. A. Markey  
 Electrical translating devices. Means for controlling energy delivered to.....H. W. Leonard  
 Electrolysis apparatus.....P. Schoop  
 Elevator-regulating brake. Automatic.....H. Graves  
 Elevator safety device.....T. Lebedzinski  
 Embroidering-machine attachment.....J. Grubman  
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 Envelop.....B. A. Brown  
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 Equalizer. Three-horse.....J. F. Steward  
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 Fence-post extractor.....F. Morgenthaler  
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 Fire-extinguishing apparatus. Dry-pipe.....J. H. Derby  
 Flue-cleaner. Steam-jet.....H. I. Coggeshall  
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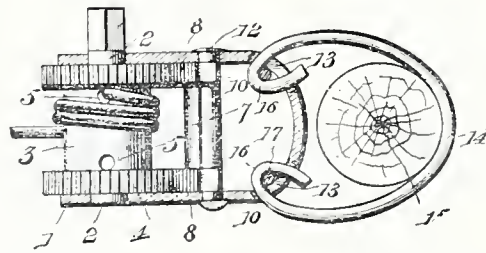
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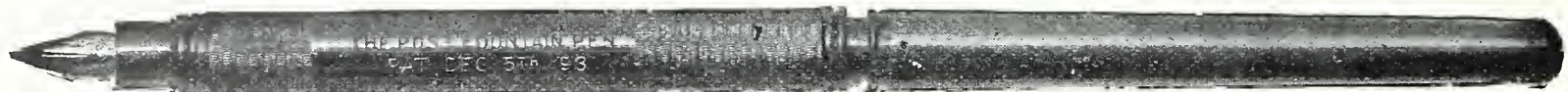
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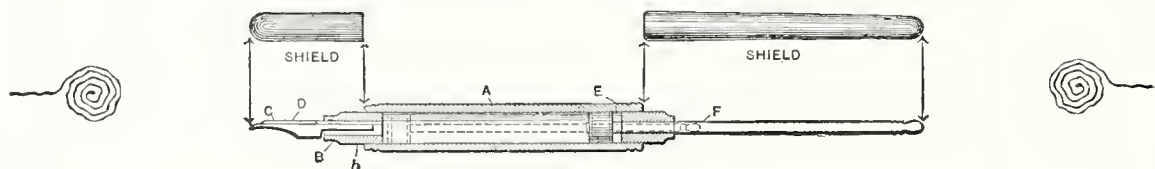
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## NIAGARA FALLS.

### DOUBLING THE ELECTRIC POWER MACHINERY.

**The New Wheel-pit will be the Greatest Similar Hole ever  
Excavated at One Time.—It will Accommodate  
Eleven Turbines, Each of Which will  
Develop 5,000 Horse-power.**

It is well known to the public that Niagara Falls is being used as a source of electrical power, and that, among other things, it runs the street cars of Buffalo, forty miles away, the electrical current being sent to that city over copper wires.

But how many people have an idea how this power is obtained? When it was first proposed, some ten years ago, to utilize the falls, protests were filed against it on the ground that their beauty would be injured. But 50,000 horse-power are now being obtained, and no one not especially informed thereof, would be any the wiser for all that he could see. Nearly all the existing machinery, which cost some five millions, is practically underground, besides being over a mile away from the falls.

Now a new and even more enormous construction is well under way, which will more than double the effective force of the falls, and this, like the completed work, will also be almost out of sight. The illustration herewith shows the new "wheel-pit" which is the essential feature of the construction and which is to be no less than 180 feet deep. To understand just what is meant by a "wheel-pit" a brief explanation is necessary.

Water is effective as a motor force almost entirely, not by its velocity but

by its weight, and this weight depends on its "head;" that is to say, on the height from which it is allowed to fall on the machinery it drives. That in question is taken from the Niagara river, a mile or more above the falls, and led inland through a canal (Fig. 1, next page) but is temporarily held back from the machinery by means of a coffer dam. When admitted, it will flow into one of a number of "penstocks," which are simply huge iron tubes, 7 inches in diameter, reaching from the surface down to the bottom

of the wheel-pit, where each actuates a turbine water wheel. These turbines are of bronze and are enormously heavy, and each of them supports a shaft 180 feet long, reaching all the way to the power house at the surface of the ground. By a most ingenious construction, however, this great weight is borne by the water which comes down the penstock, the latter being bent through a half circle so as to make its water act upwards against the turbines. (See Fig. 2.)

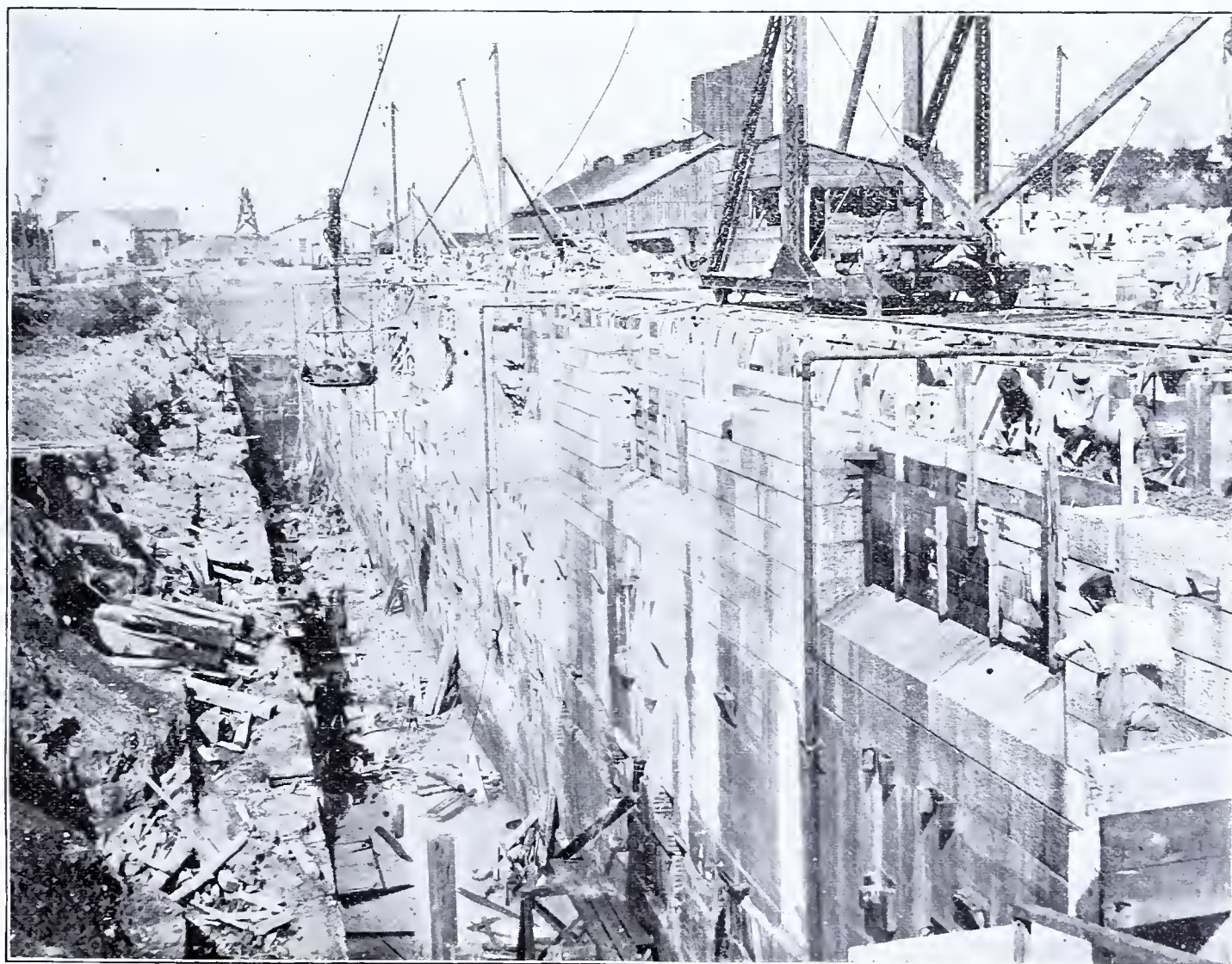
The water, after passing through the turbine, must be disposed of somewhere or it would soon fill up the wheel-pit. Accordingly, it is drawn off through a tunnel over a mile in length, horseshoe in section and approximately 18 feet in diameter, and emptied into the river below the falls, where the water level is, of course, some 200 feet lower than where it was

taken into the canal. This tunnel runs far down below the town of Niagara. It cost over a million and a quarter of dollars.

The new wheel-pit is to be substantially like the old one except that it will be deeper, longer and wider.

In order that profit may accrue to the contractors, the work on all great contracts must be done at the least possible cost and to do this requires a modern, up-to-date plant in all parts of the work. It is such an installation that the National Contracting Company has established in connection with constructing the new pit, which is said to be the largest hole of its kind ever sunk in the earth at one time. The original wheel-pit is a big hole, but it is not so large as the new pit is to be, and when it was built, it was excavated in sections, and not all at once, as this latest source of power at Niagara is to be.

THE INVENTIVE AGE has mentioned the Niagara power development in the past, but in connection with the construction of this new wheel-pit there are new and interesting features. The pit is being excavated out of solid rock. It will have an approximate depth of 180 feet, and it will be 463 feet long between channel cuts, while the width between the brick walls below the turbine deck will be 16 feet, and 17 feet 4 inches above the turbine deck. Thus, it will be seen that the pit is to be a marvellous hole. It is to be the home of eleven units of 5,000 horse power each, making a total possible output from this single pit of 55,000 horse power, and this, added to the 50,000 horse power already developed will make the total output of the Nia-



PRESENT STAGE OF NEW WHEEL-PIT AT NIAGARA.



gara Falls Power Company 105,000 horse power.

Work on the contract was commenced in November last, and it is expected that the pit will be completed by June of next year. The constructing plant about the work is enormous, and good progress has been made, the present depth of the pit being about 85 feet. A Lidgerwood cableway has been erected over the pit to facilitate the handling of the rock taken out of the big hole. This cableway extends

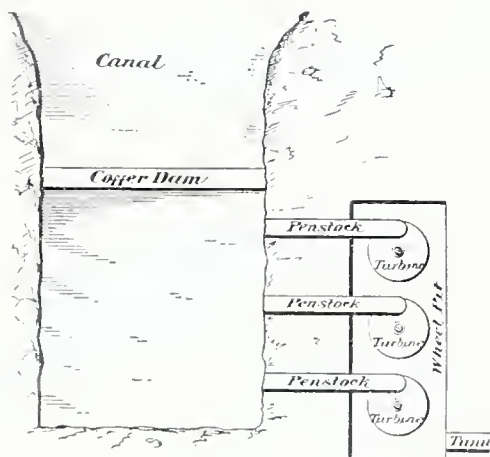


FIGURE 1.

over the pit from towers erected at the ends. One of the towers is 30 feet high, and the other 60 feet. The cable is  $1\frac{1}{2}$  inch wire rope, capable of lifting 10 tons. The buckets used have the aerial dump feature and hold two cubic yards. The length of the cable between the towers is 600 feet, but the total length of cable is 840 feet. Anchorages are provided at each end of the cable equal to 19 tons. This is accomplished by sinking a round oak log 30 inches in diameter and 25 feet long, to a depth of 12 feet in the ground and surrounding it with concrete and loading it with rubble stone piles. The buckets are raised from the pit and run along the cableway to a point near the high tower, where the rock is dumped to form a roadbed, which will allow the road to be double-tracked in the near future. The entire operation of the cableway is controlled by an engineer in a small building adjoining the high tower, a feature that does away with attendants for the buckets at the place of dumping.

In addition to this cableway the National Contracting Company has four Ingersoll air compressors; ten 100 horse power boilers; ten Sullivan Machine Company channelling machines; six Ingersoll-Sergeant rock drills; three Ingersoll-Sergeant gadding machines; two 30 ton locomotives, 40 dump cars; ten derricks and hoisting engines; one Byer's traveling derrick of five tons capacity, and about a mile and a quarter of railroad track on the ground, employed on the contract. They also have a Wagenhall electric headlight erected about 30 feet upon the high tower to aid in the night work. This electric headlight is mainly used along the cableway, while in the pit proper ten arc lamps are used.

The immense amount of work that will be performed under the provisions of the contract will be partly understood when it is known that from the pit and inlets there will be taken 68,000 cubic yards of rock, and from the shaft and tunnels there will be taken 13,000 cubic yards of rock. In the con-

struction over 6,000 yards of cut stone will be used, and 10,000 yards of Portland cement concrete will find place in the work. There will be 13,000 yards of brick laid, which means a consumption of 7,500,000 brick. In the cofferdams over 800,000 feet of hemlock have been used, and the castings, girders and pipes will call for the use of at least 1,400,000 pounds of steel and iron.

From the illustration of the wheel-pit it will be observed that on one side the masonry is well advanced and that the castings are being placed in the walls as the work progresses. These castings are of various shapes and for various purposes. They are for bearings, girders, thrust bearings and penstock bearings, and each one has to be placed with the highest possible skill and accuracy. The same illustration portrays the manner in which the walls of the pit are being channelled, this feature of the work being visible below the masonry. It is stated that the channelling of these walls is the greatest piece of channelling ever done on one contract in the United States.

The big cofferdam in the inlet canal in front of the wheel-pit work has been completed. It is 550 feet long, and is formed of two rock-filled cribs having a clay puddle between them.

A shaft 10 by 16 feet has been sunk into the tunnel heading in front of the power station in order to facilitate the extension of the tunnel for draining off the water. This extension is to be of the same section as the main tunnel and is being built on a curve  $368\frac{1}{2}$  feet long and having a radius of  $186\frac{1}{2}$  feet.

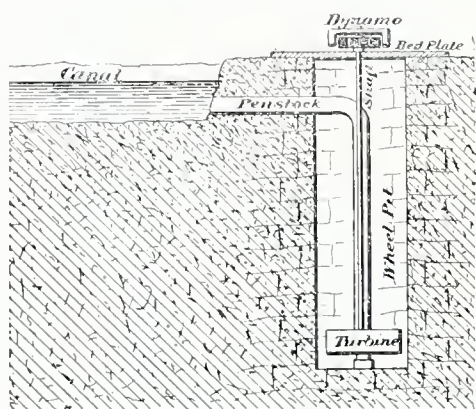


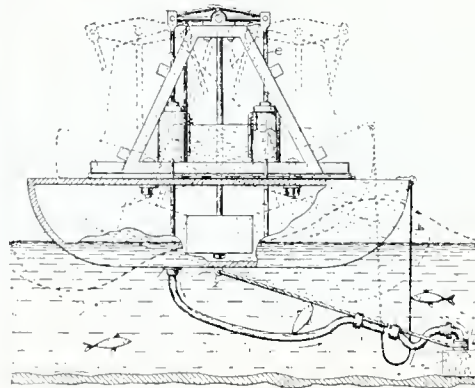
FIGURE 2.

The new wheel-pit is to be connected with the present pit by means of a tunnel situated about 130 feet below the surface. This tunnel will be 200 feet long, passing under the inlet canal, and six feet wide by eight feet high. It will be lined with brick and lighted by incandescent lamps, its purpose being to afford employees to pass from pit to pit without ascending to the surface.

#### Tide and Wave Motors.

For ages man has dreamed of utilizing the rise and fall of the tide and the motion of the waves in the propulsion of machinery, and inventors have spent their lives in trying to devise some apparatus by means of which this could be done. But the centuries have rolled away without result, and the end seems as far off as ever. Not that it is at all impossible to devise a machine to be operated by the tides in high latitudes, but because enough horse power cannot be obtained to make the machine of

any practical use. A writer in Cassier's Magazine points out why this is so. He says: "Wave motors and tide-power schemes have been almost endless in number. The former have, in a few instances, been used for light pumping work at sea-side places, but such pumping outfits have been very far from demonstrating that the wave motor could ever be



seriously considered as a prime mover where large powers were demanded; in fact, the wave motor is little better than a toy. As to power from the tides, there is little to be said, except that much money has been wasted in vain endeavors to turn it to practical account. The tide-power scheme probably always will be alluring and also disappointing. The disappointment comes from the fact that very few people seem to take the trouble to figure out how much water and how considerable a fall are required to give any useful amount of power. A horsepower for a day of ten hours, for example, would require something like 120 tons of water falling from a height of 100 feet, so that a 500 H. P. factory, say, would need 60,000 tons of water at a hundred-foot head. On the basis of 36 cubic feet of water to the ton, there would thus be over 2,000,000 cubic feet of water, and this would make a fair-sized pond, say, about 1000 feet long, 200 feet wide, and 10 feet deep. There is in these few figures something that may help to open the eyes of the tide-power plan inventor and those who are in the habit of putting money into such things."

Despite the opinion of this writer, it is difficult to understand just why some of the many patents which are continually being taken out for wave and tide motors will not do good work in a moderate way. For instance, a very recent patent, taken out by G. W. Hoff, of Rochester, N. Y., shown in the illustration below, seems to be eminently practicable on a moderate scale. It is in the nature of a float placed to ride upon the water, being anchored to the bottom and secured in such a manner that it may swing freely around its holding in any direction, so as to be at all times headed toward the wind. A pendulous weight held by the boat is caused to swing to and fro as the boat is pitched by the passing waves, and serves to operate force pumps for the purpose of compressing air in a connected aerometer or receiver on the adjacent shore. In practice, a number of these boats are associated, independently anchored, but co-acting, all having pipe connections either with a main submerged air-conduit leading to the aerometer or independently connected with the aerometer, as found most convenient.

## TEDDY'S TEETH.

An Ingenious Puzzle Which the Secretary of the Interior has Vainly Tried to Suppress.

About a month ago, a design patent was issued by the Patent Office to Wallace Odell, of North Tarrytown, N. Y. for a puzzle entitled "Teddy's Teeth." Mr. Odell had taken advantage of the many comments on Governor Roosevelt's prominent incisors to produce a contrivance something on the order of "Pigs in Clover," which had such vogue a dozen years ago. Under a watch crystal was a picture of Governor Roosevelt's face—not a caricature at all, but a good likeness—in which the teeth were made smilingly conspicuous. Several of these had holes in them and an equal number of small silver and gilt balls were provided, the puzzle being to roll the case around until all the balls were safely ensconced in the hollows of the teeth.

Mr. Odell took the puzzle to his attorney, E. G. Siggers, of Washington, D. C., and requested him to get a patent for it. The design, though perhaps not in the best of taste, was clearly patentable and after some little difficulty, Mr. Siggers succeeded in persuading the Patent Office to recognize this fact and to issue the patent. The fact was announced in the Patent Office Gazette of September 11, and the whole thing seemed settled.



Here, however, was where the usual super-serviceable friend came in. Mr. Odell is a Republican, and a strong friend and warm supporter of Governor Roosevelt, for whose election he is working strenuously. That he should desire to insult the governor is not believable. Yet when Secretary Hitchcock, of the Interior Department had his attention called to the patent, he became very angry, declared it insulting, and ordered it rescinded. Finding, however, that this could be done only by the courts, he abandoned this plan, but ordered that all the copies of the patent which the law requires to be printed and kept available for the general public should be withheld from circulation.

Of course there could be but one result from this action. The puzzle, which might have dropped still-born, was freely advertised by the Secretary's animadversions, and the demand for it became universal, so that Mr. Odell really owes a debt to Mr. Hitchcock. Governor Roosevelt, by the way, is said to have been much amused by the puzzle when it was brought to his attention and to have spent several hours in trying to plug his own pictured and picturesque teeth.

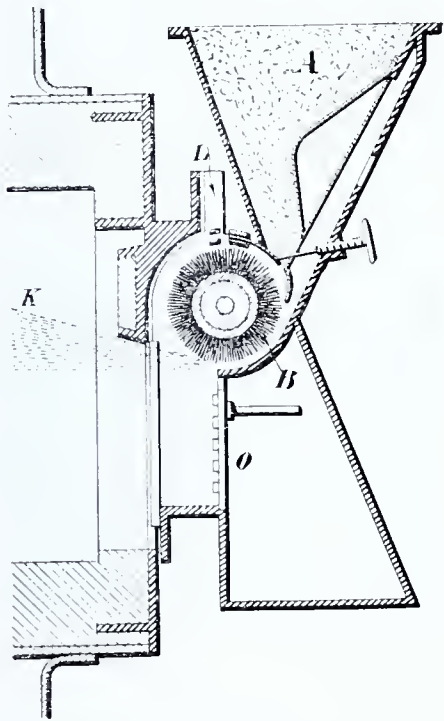


## Progress of Invention.

### NEW FUELS.

An unusual number of new patent fuels have been announced of late, this being no doubt due in part to the rise of coal in the English and European markets owing to the increased cost of transportation, and also to the rise in the price of oil, which has been marked for some time. If the coal strike continues, it will, of course, also bring forth a fresh crop of fuel inventions, but it is scarcely probable that it has yet done so.

**COAL DUST AS FUEL:**—The Illinois Central Railroad has recently been experimenting at its power house with a device for burning coal dust, which it is claimed works to perfection. The appliances are simple. A large hopper above the door of the firebox receives the dust, which is put up in bags—seventy pounds to the bag. From this hopper the powdered coal is jarred down by an automatic shaker on to a revolving brush with steel bristles. At the same time currents of air are admitted at one side and the top of the brush. Revolving several hundred times a minute, this brush throws



COAL-DUST FURNACE.

A, Coal Hopper. B, Revolving Brush. L, Air Duct. O, Damper. K, Fire-Box.

the particles of coal into the firebox, where they are instantly in a state of combustion. Dampers for the further admission of air are placed below the brush.

Tests have also been made by the Seattle Ice Company, of a new coal dust burning furnace, making the first commercial installation of this process. The combustion is said to be quite perfect, and those present at the tests say there was absolutely no smoke visible during the period of the tests. In this process combustion is secured by first grinding the coal to a flour-like powder, and then introducing it into the furnace by means of a blast, which also feeds in large quantities of atmosphere. The feeding in of the fuel in this manner also saves the labor of firemen that are employed at ordinary furnaces.

**OIL AND COAL IN FURNACES:**—Although coal has risen in price, oil has risen proportionately faster, and the fact seems likely to cause

a reversion to the old practice of using coal or some similar fuel for heating the furnaces used in drop-forging shops, which of late years have come to be almost exclusively fed with oil. The price of oil previous to the rise had been so low, and its many advantages over coal, such as lack of ashes and the uniform regularity of flame, were so obvious, that its use was rapidly extending.

But when oil advanced in price from 3 to 3½ cents per gallon, the question arose as to the economy of its use, and it was found that at the latter figure its cost was more than that of coal at \$6.00 per ton. There were some advantages, however, such as not having to handle ashes and coal, that caused its continued use. When the price reached 4 cents, the only thing that prevented a change was the hope that oil would decrease in price, and when it reached 6 cents there was nothing to do but to change.

The Chicago Union Traction Company among others is changing its boiler plants, in which this fuel has been used for sometime, to grate bars and automatic coal stokers. The alterations will cost nearly \$100,000 and the plants use 850 tons of coal a day. The well-known heat units in bituminous coal and its low cost and great abundance in the great Mississippi valley will now cause a turning of attention to the designing of furnaces in which soft coal may be used. Here is a fine field for the exercise of inventive genius.

**PEAT BRIQUETTES:**—The scarcity of fuel in Russia has long occupied the attention of Russian scientists. Coal is found there only in small quantities, while wood is by no means sufficiently abundant to warrant extensive consumption. It is proposed to surmount the difficulty by turning the enormous quantities of peat to account. In many districts the turf comprises almost the staple fuel. Its calorific power is said to be double that of wood. The turf is compressed into small briquettes, and sent to the market. It is estimated that the cost of manufacturing the turf for commercial purposes is about twenty-four shillings per ton, which, at present, compares very favorably with the price of coal.

**COMPRESSED FUEL:**—Writing from Frankfurt, August 9, 1900, Consul-General Guenther reports that a syndicate has been formed for the purpose of acquiring a patent for improvements in machinery for agglomerating fuel. The particular briquette proposed to be manufactured by the syndicate will be free from pitch or tar and, while comparatively smokeless, will give an abundant flame, and will be of a convenient size, averaging about 9,000 to the ton. The briquettes are clean to handle and are not easily fractured.

**NEW USE OF LIQUID AIR:**—Consul-General Guenther also writes that Mr. Carl Linde, who is giving special attention to machines for producing liquid air, describes in the journal of the Association of German Engineers, a furnace designed by Mr. Hempel for an ingenious application of this substance. The furnace is intended to burn low-class fuels, such as lignite and peat, the combustion being intensified

by turning the gaseous mixture obtained by evaporating liquid air on the fire. Nitrogen is first set free, after which there remains a gas containing at least 50 per cent of oxygen. The price of this gaseous mixture is said not to exceed 81 cents for 1,000 cubic feet.

**MANUFACTURE OF AGGLOMITE FUEL.** Consul D. T. Philipps sends from Cardiff an account of the agglomerite process of manufacturing fuel from coal, whether anthracite or bituminous. He says in part: "By this method, the coal and agglomerants are chemically mixed while under the influence of heat and pressure, in a sealed vessel, by which a new fuel compound is produced."

The coal and agglomerants are mixed and ground in a dry state. If tar or pitch or other liquid substances are used, they may be subsequently added; then the prepared material is put into a hopper attached to the end of a horizontal tube. The opposite end of this tube is connected with the briquette press. A worm is kept constantly revolving in the tube, conveying the material through the tube and feeding it into the pressing ram chamber. The tube passes through a small furnace, which enables the material to become heated to a temperature of 500° or 600° F. The gases evolved can not escape; hence the pressure produced within the tube is shown on an attached gauge to be about 10 pounds per square inch.

The practical value of a fuel largely depends on its ability to produce gases, which, properly burnt, yield considerable heat. Agglomerite fuel possesses this feature, due, first, to the dissociation of gases under the combined influence of heat and pressure; secondly, to the ultimate chemical rearrangement of gases and solids, while being gradually condensed and cooled previous to passing into the pressure chamber of the briquette press. The process, mechanically and commercially, is full of chemical problems and secrets.

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# SEWAGE IRRIGATION

## PART VI.

### Best Crops to Raise, and Sanitary Results of Process.

A large amount of study has been directed, especially in England, toward the question of the best crops for sewage farming, with the result of showing that in that country, at any rate, almost any crop that can be raised in ordinary farming, can be cultivated with good effect on properly managed sewage farms. Among those

hemp and the cereals—wheat, rye, barley and oats—with potatoes, beets, turnips, cabbage and vegetables generally.

In the irrigation of the plain of Gennevilliers, at Paris, by reason of the nearness of the fields to the city of Paris, the crops produced are chiefly those common to ordinary French truck farming.

As to the quantity of sewage which has been applied per acre, the experiments of the "Sewage of Towns" Commission indicated varying amounts, ranging from 400 to 500 gross tons per acre per annum on heavy

There has been much discussion at various times as to the sanitary condition of sewage farms, and formerly much apprehension was expressed as to the possibility of contaminating not only the well waters of the surrounding areas, but also the atmosphere in the vicinity. As to the contamination of well waters, the development of a clear understanding of the actual facts in regard to nitrification has gone a long way toward relegating this particular objection to sewage farming to the region of exploded ideas, in company with many other arguments of the opposition as advanced from twenty to twenty-five years ago. At the Berlin sewage farm, the effluent is so pure that it cannot be distinguished by the senses from the clearest spring water.

The question of the sanitary conditions of sewage farms was examined at length by a committee appointed by the Royal Agricultural Society in the sewage-farm competition of 1879, to which reference has been made. This committee concluded that sewage farming was not in any degree detrimental to life or health, statistics presented to it showing that the rate of mortality among farm employees, on an average, for the number of years that the farms considered had been in operation, did not exceed 3 per cent per annum, the result comparing favorably with that obtained somewhat more recently at Berlin.

In regard to the present views of English engineers, sanitarians and sewage-farm managers, it may be stated that the consensus of opinion seems to be decidedly in favor of the land purification process. If for any reason it is necessary that the effluent from sewage-purification works should pass into a stream which is the source of a water supply, the further consensus of opinion appears to be that it should, before receiving the land treatment, be clarified to the extent of removing all of the suspended and a small portion of the dissolved matter by some of the more inexpensive chemical processes. The same views, it is believed, are now held in the United States by many competent engineers, although the effluents from high-grade intermittent filtration areas are also unobjectionable.

While there are probably more sewage-purification works in England than in any other country, the sewage farms of Berlin are without doubt the most extensive thus far carried out, since they exemplify in their preparation and management the best scientific farming of the present day.

Sewage utilization in France, as a whole, has been less generally attempted than in either of the foregoing countries, although the employment of Paris sewage on the Plain of Gennevilliers is probably the most successful utilization in agriculture from a monetary standpoint. So far as known, the credit of the first attempt at sewage irrigation in the United States belongs to Mr. C. B. Daken, treasurer of the State Insane Asylum, at Augusta, Maine, who carried out a system of irrigation there about 1872. As before mentioned, there are upward of 150 plants in the United States and Canada.

A rapid review has thus been taken of the general subject of sewage irrigation. The purpose has been, not to write a scientific treatise on the matter, but to describe the principles of this important subject in as plain and simple language as possible. To those who may become interested and desire to further study the subject, a list of books will be found in the note below.\* The question of sewage disposal is becoming one of vital importance to the country at large, and this seems to be the practical and effectual manner of not only disposing, but of rendering beneficial, what is otherwise a source of danger to health.

\*Publications relating to sewage utilization and disposal.

Sewage disposal in the United States, 8 vo., New York, 1893, by George W. Rafter and M. N. Baker.

Modern Methods of Sewage disposal, 12 vo. New York, 1894, by George E. Waring, Jr. A second edition was published in 1896.

The Sanitary Drainage of Houses and Towns, 4th edition, revised and enlarged, 12 mo., Boston, 1893, by George E. Waring, Jr.

Draining for Profit and Draining for Health. 2nd edition, 12 mo. New York, 1883, by George E. Waring, Jr.

The disposal of sewage at isolated country houses. Paper, 8 vo. Providence, 1890, by William Paul Gerhardt.

The disposal of household wastes, 16 mo. New York, 1890, by William Paul Gerhardt.

Sanitary Engineering. Reprint from the Journal of the Franklin Institute, June-August, 1895. Paper, 8 vo. Philadelphia, 1895, by William Paul Gerhardt.

Sewage Disposal Works, 1st edition, 8 vo. London, 1890. 2nd edition, London, 1894, by W. Santo Crimp.

Reports of Massachusetts State Board of Health.

Engineering News, 1892-1899 inclusive. Engineering Record.



SEWAGE IRRIGATION AT PHOENIX, ARIZ.

ordinarily raised may be mentioned Italian rye grass, pasture, potatoes, wheat, oats, barley, mangolds, carrots, cabbage, parsnips, turnips, beans, rhubarb, celery, peas, lettuce and corn.

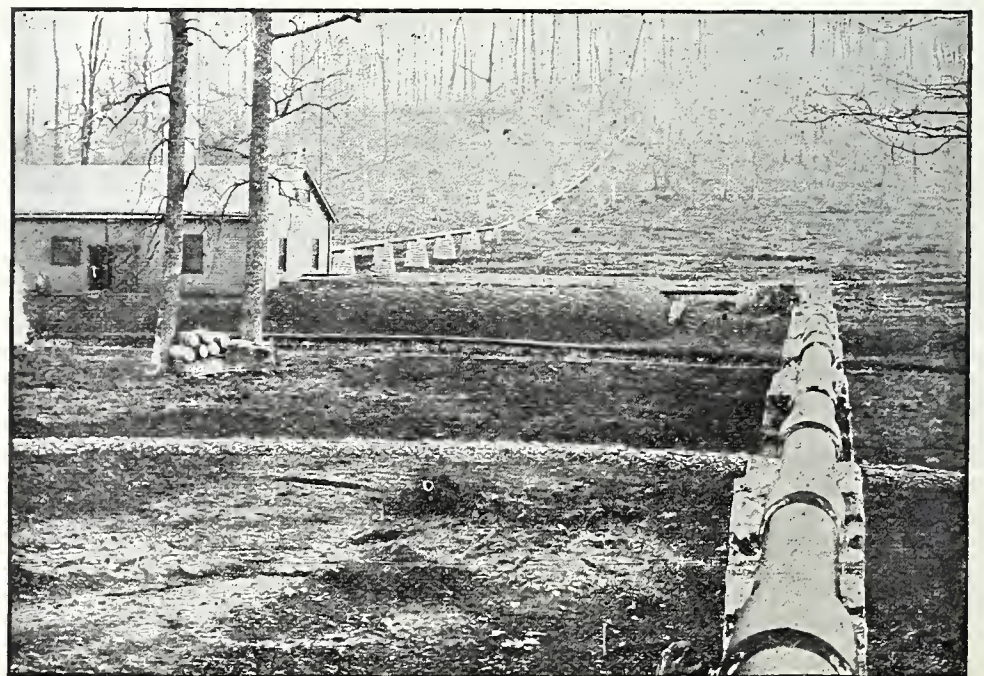
In southern climates the yam has been grown to good effect with sewage irrigation, while in southern California, orchards are successfully irrigated with sewage. The species of water willow known as osier is also grown extensively on sewage farms, not only because it is a valuable crop in the vicinity of towns, where it is extensively used in basket-making, but especially because it has the property of absorbing large quantities of water. The American water weed, anacharis, is also a very gross feeder and will assimilate large quantities of organic impurity. Among other water plants which are capable of absorbing organic impurities may be mentioned duck weed, sedges, common reed, flowering rush, water lilies, liverwort, water cress, etc. There is, however, no special advantage in using these so long as plants having commercial value can be raised.

At the Doncaster sewage farm in England, in addition to wheat, barley, oats, rye, potatoes, rye grass, clover, meadow grass and osiers, considerable quantities of small fruits, such as currants, gooseberries and raspberries, have been successfully cultivated. At Berlin the chief crops are rape, grown for seed to be used in the manufacture of oil, colza, mustard, carroway,

land in wet seasons on ordinary crops, to about 9,000 tons per acre on grass plots.

As has been stated, the daily average sewage in this country will probably be at least ninety United States gallons per head, giving the annual amount of sewage per capita at ninety-seven gross tons. On this basis an acre of land would purify the sewage of from five to ninety-three persons. Include some additional sewage which land may be expected to clarify without reference to the results of cropping, and it may be assumed that an acre will purify the sewage of from fifty to one hundred and fifty persons per year, though the quality of the soil may be expected to materially influence the result.

When examining a number of the best managed sewage farms of England in the fall of 1894, Mr. Rafter was much surprised to learn that, generally speaking, somewhat higher wages were paid on sewage farms than on farms of ordinary character in the immediate neighborhood. He also found that the wages actually paid for labor on many of the English farms are quite as high or even higher than the present rates for farm labor in many parts of this country. This is one reason why he believes that sewage farming will pay in the United States, as this fact shows that the frequently urged objection that American farmers could not afford the large amount of labor required in this work certainly has no weight.



SIDE HILL, IRRIGATION AT WAYNE, PA.



## A LUCKY INVENTOR.

Patents a Culinary Compound  
That has Netted him a Fortune in Four Years.

The part played in American life by push and energy is nowhere better exemplified than in the career of Wm. Gebhardt, of San Antonio, Texas. From the early age of thirteen, Mr. Gebhardt was obliged to support himself by working on a farm and had practically no schooling. At sixteen he secured work in connection with a hotel and restaurant, and devoted his spare time studying. At nineteen he had learned to read and write in several languages, as well as gained much practical mechanical knowledge, besides developing his decided talent for music.

It was through his connection with the hotel that he was led to turn his attention to a preparation known as "Chili Powder." In the south western part of this country, as well as in Mexico, the dish known as "Chili



WILLIAM GEBHARDT.

Con-Carne" is highly considered and much in vogue. But it requires culinary skill and some little time to properly make it. It occurred to Mr. Gebhardt that a compound which would enable this dish to be prepared in a few minutes by anyone, with or without previous experience, would be a great success. He tried it, making six dozen bottles, which he ground in a coffee mill, for a starter. This was four years ago, and his factory now turns out 6,000 dozen bottles daily.

"Gebhardt's Eagle Chili-Powder," as the compound is called, is made by taking Mexican chili-peppers or *pesado* (*Capsicum annuum*), extracting all of the stems and seeds from the hulls and adding to every one hundred pounds of hulls twenty pounds of garlic (*Allium schaeen-oprasum* or *Allium sativum*). To this mixture of chili-pepper hulls and garlic, a solution of black pepper and dictamo is added, and allowed to soak for about one hour. The mass thus formed is then ground and rolled or pressed into layers or strips resembling vermicelli.

These are spread thinly on trays, and exposed to a drying heat at a tem-

perature of approximately 125° Fahrenheit, fresh air being supplied continuously by a fan. This drying takes twenty-four hours, and immediately after its completion the final step of pulverizing must be prosecuted, no delay being desirable for the reason that the strips rapidly absorb moisture when exposed to a normal temperature, and thus become soft or pasty, and hence difficult to grind. The reason that the flavor of chili-pepper and garlic is retained during drying process is that the pasty mixture, when exposed to heat, becomes crusted on the outside by the quick drying of the surface, causing the interior to retain its original flavor, no means being provided for its escape.

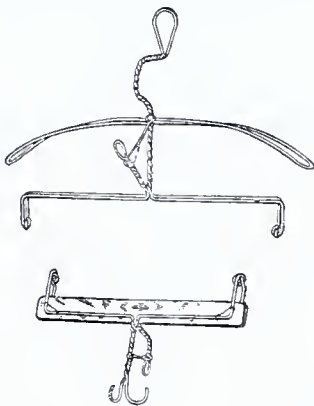
The concluding step in the preparation of the compound is the addition of powdered cumin-seed, known as "Malta cumin-seed" (*Cuminum cyminum*), and organum (*Origanum cretici*), the proportions being two hundred pounds of the prepared chili-pepper and garlic to fifteen pounds of cumin-seed and seven pounds of organum. Anyone who doesn't like this, evidently doesn't care for delicious things.

Mr. Gebhardt does not confine his attention to chili-powder, however. Through his patent attorney, Mr. E. G. Siggers, 918 F Street, Washington, D. C., he recently took out a patent on an ingenious device, which nine people out of ten would think of little use, but which has netted its fortunate inventor quite a sum. This device is for rebending crown seals for bottles. Actual tests have shown that the payment of a small price, say five cents a pound or gross, will cause the user of bottles with such crowns to return them in good condition. They can then be rebent, making them answer the same purpose as new ones, at a considerable saving.

The machine can be operated very cheaply by a boy, who can attend to it at odd times, and thus keep a stock on hand sufficient to meet demands, particularly in instances where the manufacturer may run out of new corks.

### Complete Clothes Hanger.

Everyone who cares at all for his or her clothes, of course recognizes the fact that it is highly advisable to hang them up on some sort of a clothes hanger instead of laying them over a chair to be crushed into a thousand wrinkles or hanging them on a hook which, sooner or later, betrays the fact that it has been used by an ugly



bulge, almost impossible to eradicate. But most hangers are either too complex or occupy too much room, the average man or woman having only a limited space in which to keep his or her clothes. The need for a close, compact hanger, which will accom-

modate practically a whole suit in a minimum space, and above all, which will keep the "pants" from bagging at the knees, has long been felt.

It was this need that led M. A. Gates, of New York state, to turn his wits devising some device which would meet these requirements, and which resulted in his producing the "Gates Complete Suit Hanger," on which can be placed hat, coat, overcoat, cane, trousers and shoes, the whole occupying much less space than would be occupied by the man who wore them, and yet being kept in perfect shape.



One of the best features is the bend in the top part for receiving the collars and keeping them always in shape to fit the neck. Extending backwards, it holds the garments from the wall. The trousers are hung right end up, making it unnecessary to remove articles from the pockets. The stretcher is provided with light springy wooden slats which press the bottoms of the trousers. The shoes serve as a weight to take the bagging out of the knees and to keep them creased. The entire suit can be hung or taken down in less than one minute.

The Ladies' Suit Hanger holds Sacks, Furs, Hat, etc., and all dresses, in most accessible and convenient form. To economize space the skirts are clamped well up under the sleeve bows, and are kept even and smooth and pressing saved.

Inquiries regarding agencies and territory for the hanger should be addressed to M. A. Gates, care the Inventive Age, Washington, D. C.

## IMPORTANT COURT DECISION IN PATENT AND TRADE MARK CAUSES.

U. S. Court of Appeals—First Circuit.

BRESMAN *et al.* v. TRIPP GIANT LEVELLER CO., (two cases.)

FULLER *et al.* v. SAME. Decided June 5, 1900.

1. CUTCHEON—MACHINE FOR BEATING OUT THE SOLES OF BOOTS AND SHOES—INFRINGEMENT.

Claim 1 of Letters Patent No. 385,893, granted to James C. Cutcheon June 19, 1888, for improvements in machines for beating out the soles of boots and shoes, construed to be confined to that portion of the mechanism which lies between the actuating-jacks and the crank-shaft, and infringement of the claim is not avoided by the substitution of mechanism different from that described in claim 4 between the crank-shaft and the source of power.

2. CONSTRUCTION OF CLAIMS—SPECIFIC AND BROAD CLAIMS.

The claims of the patent should be construed, where they reasonably may be, to cover the entire invention of the patentee, and where a patent contains several claims, some of which are limited to details, the others are *prima facie* not to be restricted by insisting that they contain as necessary elements the details which are specifically covered by other claims.

3. INFRINGEMENT—USER OF INFRINGING MACHINE NOT MANUFACTURER.

The fact that a defendant is merely a user of infringing machines and not a manufacturer does not affect the right of complainant to a preliminary injunction unless under exceptional circumstances, as where it appears that his general market is not jeopardized and that he can be made entirely good by the payment of damages equivalent to a license fee.

U. S. Court of Appeals—Third Circuit.

FARQUHAR COMPANY v. NATIONAL HARROW COMPANY. Decided June 1, 1900.

INUNCTION—THREATENING SUITS FOR INFRINGEMENT OF PATENTS.

While the owner of a patent may lawfully warn others against infringement and by means of circulars or letters distributed among agents and customers of a manufacturer of goods claimed to infringe, give notice of his rights as he understands them and of his intention to enforce them by suits when done in good faith, the sending of such notices and circulars in bad faith and without any intention of bringing the suits therein threatened, but solely for the purpose of destroying the business of such manufacturer, constitutes a fraudulent invasion of property rights, against which the party injured is entitled to relief in equity by injunction.

# PATENTS

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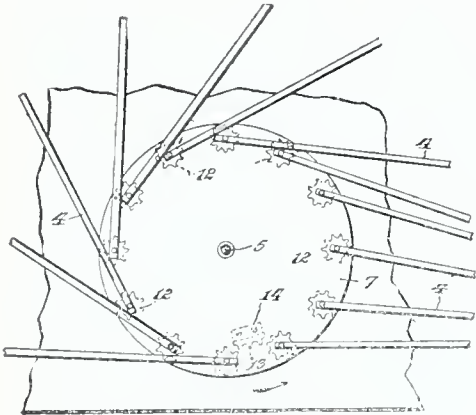


## CLEVER NEW PATENTS.

**Ingenious Devices Intended to Supply Long Felt Wants—Cotton Press, Pneumatic Straw Stacker, Card Exhibitor and Others.**

### Card Exhibitor.

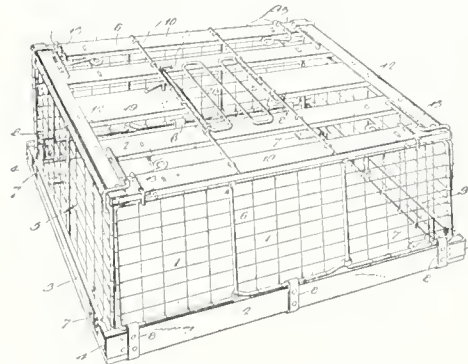
Everyone is, of course, familiar with the ordinary picture exhibitor where a series of frames are set on a circular drum like leaves of a book. To make this of value, however, the spectator must be able to walk around it and



turn the leaves with his hands. It is thus unavailable for exhibiting a series of cards in a show window, for instance. But J. A. Mangold, of Moundsville, West Virginia, has invented a most ingenious adaption of this apparatus, which not only enables the drum to be revolved so as to bring each picture or card in succession to the front, but also automatically spreads it out flat, away from interference with the other frames, at the very moment when it is in the best position to be seen from the front of the window. The illustration above shows a horizontal section of this device, in which the different frames are represented by 4, 4; the drum by 7 and the actuating shaft by 5. Each frame is pivoted on a pinion, 12, which, as the drum revolves, engages with a rack, 13, and is completely turned, side for side, and spread out flat just as it reaches the front of the show window.

### Folding Coop.

The farmer who ships his chickens to market and then finds that he has to either lose his coops or pay return freight by bulk on the clumsy contrivances, which occupy as much space when empty as they do when full, should welcome the folding coop patented by Charles I. and William A. Neal, of Bungers, W. Va. The Neal brothers have had practical experience in



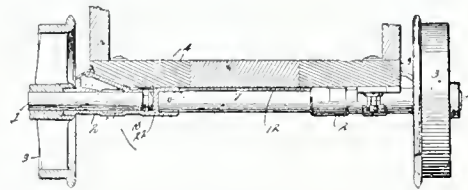
handling fowls, and out of it have contrived a coop which is strong, handy and cheap in the long run, and which, when empty, can be shut up into a space no larger than is occupied by its base when full. The illus-

tration shows the construction so plainly that description is almost superfluous. The ends of the coop, 5, 5, are set inside the ends, 3, 3, of the base, and drop down first when it is desired to fold the coop. Then the whole top is lowered upon these, and then the sides, 1, 1, which are secured by straps to the top of the sides, 2, 2, of the base, are closed down over all. There are suitable catches at 13, 13, to hold the whole together, when the coop is unfolded. The door, 20, is placed in the top, in the middle of the center slat, 19, which is cut away for the purpose.

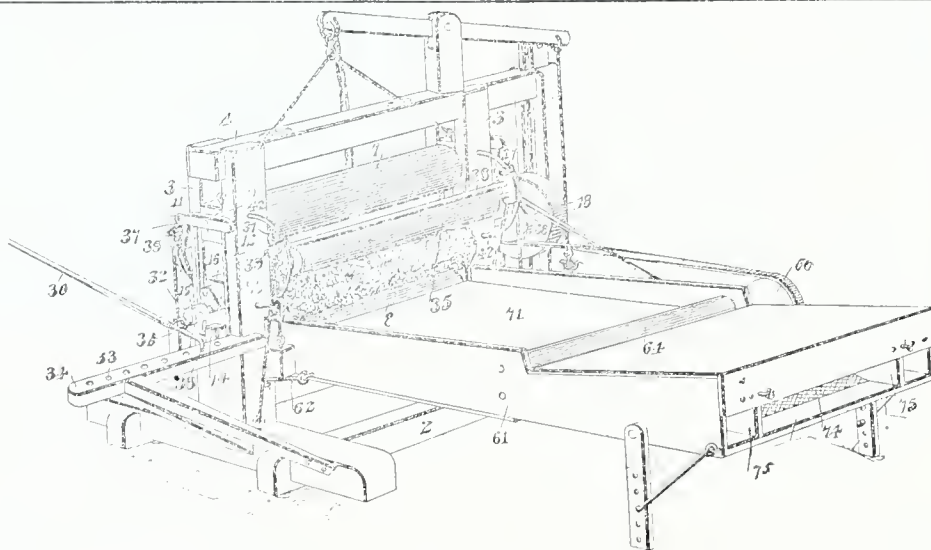
### Car Axle.

In early days, before the gauge of railway tracks had settled down to uniformity, there was great need for some method of axle or truck construction that would enable a car to be easily switched from tracks of one gauge to those of another, but no particular success seems ever to have been attained in the various attempts to achieve this. To-day, there is little need for such an invention for railways, though one would be still valuable for cars which are to run on light

tracks at mines and the like. These, of course, do not have to be anything like as strong as would be necessary in the case of railway cars, and a construction that would not do at all for the latter will serve very well for lighter work. Accordingly, J. S.



Hickey and J. H. Egbert, of Anaconda, Mont., have recently patented an axle of this description, as illustrated above. In the figure, 4, represents the body of the car; 1, 1 two sections of the axle (one of them shown in longitudinal section) which are forged to the trucks, 3, 3; 2, 2, bearing sleeves, and 7, a tubular connecting section. It is obvious that the gauge can be altered by pushing in the axles, 1, 1, until they bring up against the transverse bearing walls, 22, 22, or by drawing them out until the limit of the bearing sleeves is reached. The truck also has an improved method of oiling.



### Cotton Press.

The rapidly growing favor with which the round cotton bale is regarded, is bringing forth numbers of new inventions for producing it. The latest machine for this purpose is the invention of R. R. Pace, of Homer, La., and is certainly a most ingenious one. Further, it is very simple, relying on weights instead of on a complicated system of levers, chains and sprockets to compress the bales as they are wound. Further, it can be made fast to any size of gin and has an attachment by which it takes the cotton direct from the gin and forms it into a bat of the right size for rolling.

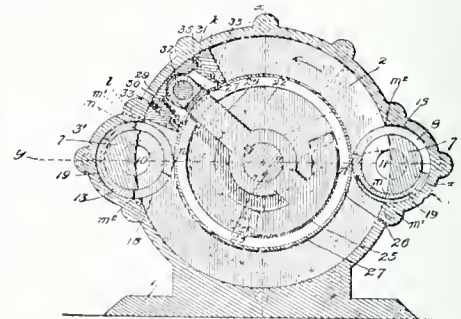
In the illustration, 15, is the core rod on which the bale is being wound, 7 and 8 are two compression rolls, 8 being fixed and 7 being journaled into sliding boxes, 11, 11, which can move vertically between the uprights 3, 3. From 11, 11, weights are suspended by means of U-shaped supports, and can be increased or decreased to suit the density of the bale desired. Two lateral compression rolls, 35, 35, (one being out of sight behind the machine) also compress the bale by a most ingenious construction. Their ends are set in shoes, 37, 37, which are connected by a tie rod 38, and which slip along semi-circular guide yokes,

42, 42, to which they are loosely secured by rings. These lateral compression rolls are made to press against the bale by means of weights, 62, 62. These weights are suspended by ropes, which are not fastened tightly to the tie rod 38, but are wound several times around its lateral extensions 39, 39, carried down and secured to ring bolts. Of course, by increasing the number of turns around 39, the friction is increased and the pressure of the lateral rolls on the bale may be adjusted to produce the density desired. Power is communicated to the press through the pulley 18, and means are provided to lift the compression roll 7, out of the way after the rolling is finished, and permit the bale to be removed. A leverage system for withdrawing the core rod, 32, is indicated at 30, 31, 33 and 34.

The attachment for forming the bat as the cotton comes from the gin is indicated at 71. Two hinged sides, 75, 75, are adjusted to the mouth of the gin and the cotton passes between them over the web 74, to the superimposed compression rolls 64, 64, (lower one not shown in drawing). These are actuated by the pulley 60, which derives its power from the pulley 68, (which is of exactly the same size), so that the cotton bat is supplied to the bale at exactly the rate needed.

### Rotary Steam Engine.

It has been a good many years since inventors began to turn their attention to efforts to devise some form of steam engine that would allow the expansive force of the steam to be applied directly upon the piston in a rotary direction, instead of radially upon the drive-shaft. The object, of course, was to lessen the friction between the shaft and the bearings and thus obtain greater speed with less expenditure of steam. Until recently, however, attempts in this direction have not been as successful as one

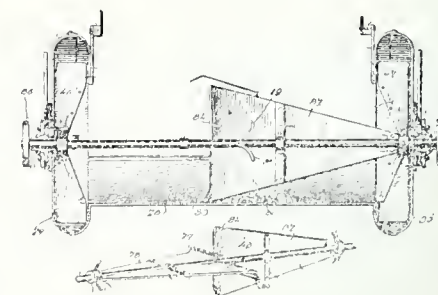


could wish, and there is plenty of need for the clever rotary engine invented by J. B. Kelly, of Portland, Oregon, a cut of which is shown herewith. In this, 30 is the piston, square in cross section but curved longitudinally to conform to the shape of the cylinder. It is connected to the arm 28 by the pin 32, thus allowing a slight freedom of motion. The steam ducts are at 19 and the steam follows the direction shown by the arrow. Of course, in such a construction, the ordinary valve will not serve and recourse is had to a new and ingenious method of admitting and exhausting it from the engine.

### Pneumatic Straw Stacker.

Farmers who have to handle wet straw, sunflower stalks and the like with threshing machines fitted with the ordinary stacker will welcome the beating improvement patented by W. J. Randolph, of Jennings, La., which threshes and separates the straw and drives it towards oppositely located fans, which hurl it far away.

The illustration below shows the details of the beater, 48, and of the fans 46, 47. In it, 28 represents a beater casing extending from side to



side of a threshing machine. At the ends are the fan casings 29, 30, which are closed on their outer sides and open into the beater case on the inner ones. The beater itself, 48, which is shown in detail in the lower illustration, is a ingenious device. Notice the curved ends of the four blades, 79, 80, 84 and 85. This form not only greatly adds to the strength of the blades, 78, 82, and prevents their being easily loosened or twisted out of shape, but also breaks up the wet bundles of straw or weeds, and creates a blast which drives their remains in towards



the fans, 46, 47. These fans, of course, create a blast which drives the straw up a stacker tube (not shown) into which each of the casings opens, and hurls it far away. Power is supplied through the pulley, 86. The test of actual service has shown this beater to be most effective.

Another valuable detail of Mr. Randolph's invention is the placing of a species of ball and socket joint in the stacker tube at a little distance from the fans. By suitable ropes or chains, the stacker tube can be easily revolved on this joint so as to point it in nearly any direction that may be desired, thus distributing the straw thrown out over a considerable area and preventing its accumulation in one spot from interfering with the work of the machine.

A further improvement resides in the chaffing pan or tray, which is mounted and reciprocated wholly independently of the cleaning-shoe of the threshing-machine, and is arranged for easy and quick removal without dismantling the operative elements of the stacker or the threshers.

### Patents in Germany.

Germans are demanding a reform of their patent laws. They complain that too many patent applications are rejected, only 30 per cent being allowed; the cause being defects in the mode of examinations and granting of patents. The force in the Patent Office is also said to be insufficient for the work.

Statistics for last year show that 21,080 applications for patents were received and only 7,430 allowed. Trade-marks seem to have a better chance. In 1899, 9,761 applications were made and 6,448 granted. The receipts of the German Patent Office last year were about \$1,000,000, and the expenses less than half that amount.

### Petroleum Under the Sea.

A fine field for inventors is offered by the formation of a committee at Baku, Russia, to discuss the exploration and working of petroleum under the sea near that place. Several things are to be considered: (1) If it is advisable to reclaim that part of the sea by filling it in to the coast, or to reclaim single spots forming islets not connected with the mainland: (2) To devise means to prevent accidents to workmen by fire, and to secure the submarine works from destruction and from access of the sea water into the tubes of the wells and to prevent the wasting of the oil: (3) To devise measures to prevent the new works on the sea from interfering with the shipping of the port of Baku.

### Australian Patent Laws.

According to a petition recently submitted to the Legislative Assembly of Victoria, Australia, parts of the patent laws of that colony are highly objectionable to the inventors there, who complain that certain privileges are allowed to foreigners which are refused natives. For instance, patents can be procured there by foreigners although their inventions have previously been introduced into the colony, while natives can only get them if the patent is applied for before the invention is put on the market. There seems to be no system of caveats, such as obtains in the United States.

The petitioners "urge that partiality in favor of foreign manufactures should be abolished, and that no special privileges in the waiving of novelty or otherwise, should be extended to the citizens of any foreign country which does not grant reciprocal privileges to the citizens of Victoria. In Germany, France, and even in the United States of America and Great Britain, the Patent Laws are so very rigorous and harsh to foreigners, that Victorian Inventors are unable to secure patents there under satisfactory conditions, and reciprocity with Victoria is not in force."

The petitioners also entreat that the Legislative Assembly will enact "that the Patent Office examiners' reports, as well as all other documents and records whatsoever, in connection with all patent monopolies granted, shall be open to public inspection in like manner as is the case in the United States of America and Canada, so removing many flagrant evils inseparable from the keeping secret of such matters." They "further entreat that your honorable House will take steps to remedy the long continued and grievous delay and shortcomings, in respect to the issue of publications from the Patent Office respecting new inventions and monopolies granted under the Patent Law, that is, publications of the various descriptions issued in Great Britain and in the United States of America, for public information and to avoid burdensome expenses and delays to those manufacturers and others who have to keep abreast of improvements of the industrial arts. Although the Patent Office revenue from fees is in excess of its expenditure, and the taxation of brains through the Patent Office was, your petitioners feel assured, never contemplated by your Honourable Houses, and although such publications are essential factors in the promotion of technical education and of industrial progress, yet one of the most important publications (entitled *Patents and Patentees*) issued at the Victorian Patent Office, is nine years in arrears, and, as issued, is utterly unfitted to and fails to meet public requirements. These volumes are not only in arrears, but after being printed are not available except at a prohibitive price. Your petitioners suggest that at no greater expense, full printed copies of all complete specifications accepted could very easily be issued in separate parts, not in arrears, and at a reasonable price."



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AND PATENT INDEX.

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## Reconstructed Granite.

The Municipal and Railway Record describes a new and interesting material under the name of "reconstructed granite." This, it explains, is simply granite pulverized, molded into the desired shape and fused at a temperature of 3000° Fahr. It differs from the natural granite in various useful ways: in being absolutely fire-proof, as it can be heated red hot and thrown into cold water without being in the slightest degree injured or affected thereby; in resisting the action of every solvent, acids and alkalis of all kinds, except hydro-fluoric acid; and in being frost-proof, having been tested in liquefied air at an estimated temperature of 350° below zero without injury.

## A Foot Ball Invention.

Mr. E. Manley, a graduate of Harvard, has invented a new form of goal post, that will free football from one of its most dangerous features. So far as known, he has not patented his idea, presenting it freely to the college world. The invention is so simple that the wonder is that no one thought of it before. The goal posts will be set back ten feet from the goal line instead of being on it as heretofore. But at the point where the crossbar formerly was, arms will project out over the goal line, supporting the crossbar. By this arrangement the bar will be over its proper place, while the unyielding goal posts will be so far away that the carrier of the pigskin need not fear for his head when he hurls himself for a touchdown. Technically the position of the goal posts is not in accord with the intercollegiate rules, but this is a mere matter of words.

## Threatening Suits.

A case of the widest interest to all manufacturers of patented articles has just been decided by the United States Court of Appeals for the Third Circuit. The decision, broadly speaking, permits a manufacturer to prevent, by injunction, a rival from injuring his business by circulating, in bad faith, notices among his customers declaring that the manufactured articles infringe patents owned by the rival, and

warning them to cease their use. Bad faith must be proved, of course, as the owner of a patent which is being infringed has the right to use all lawful means in protecting it. The court says:

"Where notices are given or circulars distributed in good faith to warn against infringement, no wrong whatever is committed; but where, \* \* \* they are not made or issued with such intent, but in bad faith, and solely for the purpose of destroying the business of another a very different case is presented. In such a case property rights are fraudulently assailed, and a court of chancery, whose interposition is invoked for their protection, should not refuse to accord it."

## Cellulith.

Consul General Guenther sends to the State Department from Frankfort an account of a new invention, termed "Cellulith," which is causing considerable interest in Europe and which seems to be worthy of study by American inventors. It is well known that in the making of paper, a continuous beating of the pulp produces a transparent and elastic mixture which hardens on drying and greatly strengthens the paper. Cellulith is prepared by beating the pulp for a much longer time than is necessary in the production of paper. The operation may last from forty to one hundred and fifty hours, or until there is a homogeneous mass having no trace of fiber. The air in the substance is removed by beating for two more hours; if allowed to remain it might destroy the regularity of the material. If desired, suitable colors are added, and then the substance is heated, the hot cellulose liquor passing into a vessel having a perforated bottom through which it drips. Containing 96 per cent of water, the material has the consistency of thick honey. The water is evaporated either by natural or artificial heat, and the pulp hardens, gradually attaining the consistency of horn, and may be worked like it. Combined with sawdust and 30 per cent of lamp-black, the result is a kind of dark ebony; this is dense and may be polished.

## Fireworks.

Comparatively few devices for fireworks are patented, their inventors preferring to take their chances of being able to retain the formulae for them as trade secrets. Each manufacturer has his own specialties and rules for making them, known only to himself and the men who do the work. Take the strings of jewels, for example—the festoons of colored lights that, after the explosion of a bomb, float about in the air like unclasped necklaces of rubies, diamonds and emeralds, changing from one color to another and perhaps to a third or fourth before they disappear. These are all the work of a single man, who is supposed to be the only one that can make them, and who makes nothing else. They are composed of little cylinders of pasteboard, about three-fourths of an inch in diameter and four inches in length, filled with a combination of chemicals. The gold effects are produced by sodas, the blue by arsenic, the red by carbonate of

strontia, the green by chloride of brytia. Orange, purple and any other color can be introduced. In packing the cylinders the man puts in a layer of chemicals that produce red, then amber and white on top of each other, each being of sufficient quantity to burn five seconds. Each of the cylinders has a fuse or slow match made of lampwicking soaked in a solution of powder and starch. The cylinders are attached to a string about four feet apart. The string is carefully wound about them so that it will not tangle, and then they are packed away in a rocket case shaped like a horn. The small end of the horn is filled with explosive powder connected by a time fuse that will burn long enough to allow the rocket to rise 1,000 feet when it explodes, bursts the pasteboard horn and releases the rolls of cylinders, which unfold and sail off in the air like strings of jewels.

## The Nobel Prizes.

The first award of Nobel prizes, which will be made on December 10, of next year, is naturally awaited with great interest by all workers in lines of scientific knowledge. The prizes were offered in the will of Dr. Alfred Bernhard Nobel, who left his large fortune to constitute a fund, the interest on which was to be distributed each year in five equal prizes to (1) the person having made the most important discovery or invention in the department of physical science; to (2) the person having made the most important discovery or having produced the greatest improvement in chemistry; to (3) the author of the most important discovery in the department of physiology or of medicine; to (4) the author having produced the most notable literary work in the sense of idealism; to (5) the person having done the most, or the best, work in establishing the brotherhood of nations, for the suppression or the reduction of standing armies, as well as for the formation and the propagation of peace conferences.

The State Department has been recently notified of the laws governing the prizes. Those for physical science and chemistry will be awarded by the Swedish Academy of Sciences; for works in physiology or medicine, by the Carolin Institute of Stockholm; for literature, by the Academy of Stockholm; finally, for the work of peace, by a committee of five members, elected by the Norwegian Storting. Some of the rules do not seem entirely fair according to American ideas. Thus, no one can submit a discovery, invention or production of his own in competition for a prize. Every competitor must be proposed by a "qualified" person, by which is understood one of the professors of certain specified academies of science and universities or by learned men who have been specially invited to propose candidates.

## New Form of Wheel.

A new form of wheel has been devised in France which is said to greatly lessen the jolting due to rough roads. It is simply an ordinary wheel surrounded by a circular rail whose diameter is slightly larger than its own and on which it rolls, keeping interiorly

tangent of it. On macadam or any smooth, hard roadbed this movable rail has no advantage. But when the road is rough or muddy, or on a stone pavement, it is said the advantages of the invention become evident. When the ordinary wheel meets an obstacle it is checked and transmits a shock to the passengers. Then it surmounts the obstacle, lifting its load vertically. The force of traction being exerted horizontally, the necessary effort is considerable. When the obstacle has been passed, there is a fall and another shock, and the same thing happens at every obstacle.

When the new wheel reaches the obstacle, it is checked just as the ordinary wheel is; but at the same time it forms an inclined plane on which the inner wheel, it is said, moves easily and without shock, until the weight of the load causes oscillation of the circular rail. The descent from the obstacle is made, it is said, with equal ease and without shock, the rail always acting as a bridge between the road and the obstacles upon it. On a muddy or sandy road, the ordinary wheel sinks in. Traction becomes very difficult, a considerable segment being always in contact with the earth. In this case also the movable rail, it is said, produces its effect by acting continually as a lever to help the wheel up.

## Moving Stairways.

"Moving stairways" have recently been adopted experimentally on one of the up-town stations of the New York Elevated Railway, and it is announced that if they are mechanically successful, they will be adopted at all other stations where there is room for them.

These moving stairways were one of the novelties of the Paris exposition. The idea, doubtless, had its origin in the moving side-walk at Chicago, which has been so largely developed in Paris as a means of communication between distant parts of the exposition—the Esplanade des Invalides and the Champ de Mars, for instance. The moving stairways, themselves, have been adopted of recent years in large Paris stores, as an advertising novelty as well as to serve a practical purpose. In the Exposition they are scattered in various places, and the charge for riding on them is about two cents. They are driven by electricity, and save much weary stair-climbing. Some of them have wooden ribbed treads, but the majority have a smooth floorcloth surface.

Americans will doubtless wonder why elevators are not used; but the elevator in Europe has never been developed as in the United States. The buildings are not so high, for one thing; the sky scraper is unknown, the average being only four or five stories, and the relatively few elevators in use in the newer edifices move so slowly and in such a wobbly manner as to cause apprehension for their security. They are also very small, as a rule, while the moving stairway can accommodate a large number of persons. In New York, they are expected to win back to the elevated roads a certain percentage of the traffic that has gone by the surface railroads since the improvement of the latter.



## HOW THE RACE WAS WON,

## A Tale of the Next Century,

BY

CRITTENDEN MARRIOTT.

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It all begun at the America's Cup races in 1899, and ended two years later in the fall of 1901. To be exact, it began at the very moment that the Columbia, swelling white from deck to towering truck, swept across the line in a mist of flying spray, and a thousand steam whistles burst into gigantic applause, announcing to a waiting world that the Cup would stay on this side for at least another year.

It was at this instant that Miss Virginia Wentworth, her teeth flashing, her eyes glistening, her cheeks flaming, turned to Frank Stanhope and cried with quick emotion; "Isn't it glorious. Oh! I could love a man who could carry off a prize like that."

This remark was unwise, unless Miss Wentworth wished to invite what followed. For no one had ever accused Stanhope of being backward where women were concerned. Besides, he was very much in love with Miss Wentworth. So he instantly turned, bent over the girl, so that no one else might hear and whispered: "Will you love me if I carry it off, Virginia?" whereupon, Miss Wentworth, with a suddenly heightened color, turned quickly aside and made a remark to a girl companion.

But the question, once asked, had to be answered sooner or later, and the time when it must be, came the next afternoon, in the disjointed intervals available between the departure of one guest who had dropped in on Miss Wentworth to get a cup of tea and the arrival of another who came for the same purpose. Naturally, Stanhope would have chosen a better opportunity if such were to be had. But tete-a-tetes with New York belles are not always easy to secure, even before the season begins, and Stanhope believed in striking while the iron was hot. So, in intervals between discussions of the coming opera season with Mrs. This and of the first ball of the winter with Mr. That, he pressed his suit with vigor.

"But it's all so commonplace," said the girl, a little wistfully, when he had finished. "There isn't a bit of romance left in life any more. Now, if you were a pirate or something and should carry me off, why, then, I should either love you or hate you—I'm sure I don't know which. But it would be something different."

Stanhope smiled down on her. "You remember what you said yesterday, don't you?" he asked.

Miss Wentworth blushed slightly. "Oh, yes," she said. "Wasn't it foolish? I was carried away by the moment and thought that I could love the man who defended the Cup so splendidly. But probably he has cross eyes and a red nose."

Stanhope disregarded her banter. "The Englishman has said that he will challenge again," he said, slowly. "I shall build a yacht and defend the Cup."

"But you are not a yachtsman!"

"I shall become one, if—"

"But you know how seasick you get when the water is rough!"

"I'll get over it, if—"

"I won't promise! I won't promise!"

"I don't ask you to do so. But I do ask you to be with me when my yacht crosses the line a victor a year or two from now and perhaps—perhaps the moment may carry you away again. Now, good-by."

"Good gracious! You are so sudden. Where are you going?"

"To prepare for the race. Two years isn't much to learn all that I must."

"Oh! you foolish boy!" But it was with a very tender look in her eyes that Miss Wentworth watched Stanhope as he went from the parlor.

An hour later he was closeted with Neil Burke, the famous yacht designer.

"You said once that you would do anything for my father's son, Mr. Burke," he was saying. "Now I'm going to claim your promise. I've got to defend the cup next time. To do so, I must have a yacht that can defeat all other would-be defenders, and then can defeat the challenger, no matter how good it may be. Will you help me?"

"It's my business to do so," returned the designer, "and in this case it will be my pleasure as well."

Stanhope drew a long breath. "That's good," he said. "Spare no expense—none. Even if it runs into the millions. I will spend my whole fortune if necessary to assure this victory. I can't tell you how much hangs on this race."

The designer's face grew serious. He drew a sheet of paper toward him and began to figure. At last he threw down his pencil. "Stanhope," he said, "If you mean exactly what you say and if you are rich enough and have the nerve to risk it, I can assure you of victory as certainly as any human event still in the future can be assured. But it will cost a great deal."

"Never mind the cost. I have the nerve, I believe; and I have the money—that is, I have anything within reason."

"Ah! But perhaps you'll think that this isn't in reason. Will—and can—you risk seven million dollars on the race with the certainty of winning, unless something altogether unforeseen should occur?"

"Seven millions! Good God! How can you possibly spend seven millions?"

"I said risk, not spend. And the risk will be very small. Nearly all of the money will be restored safe and sound—less the cost of the yacht, crew and so forth, say half a million. But the seven millions I must have in coin or, better still, in bars of solid gold. Will you risk it?"

Drops of sweat stood on Stanhope's forehead. "Mr. Burke," he said. "I am reputed to be rich and I am. I suppose the market value of my property is about ten millions. But in actual cash I am poor. I shall have to sell everything to get this gold. To sell in haste may cost me one-third of my fortune—certainly one quarter of it. Suppose I should not be able to raise quite seven millions, what then?"

"Oh, six millions or even five would do at a pinch," returned Mr. Burke, nonchalantly. "Seven is best but a less amount would almost certainly do as well."

"How soon do you want the money?"

"Eight or nine months from now will do."

"And you promise me success?"

"As positively as anything can be promised."

"Very well, you shall have it. Now explain your plans to me." And under his breath, Stanhope murmured: "I wonder whether this sort of thing is romantic enough to suit her?"

\* \* \*

Two years passed away and the date of the great international races was fast approaching. Stanhope had been readily admitted to the Yacht club, and his boat, constructed by the famous old designer, had been accepted as the defender of the Cup. She had been launched some two months before and had joined in a series of informal contests with the last Cup defender, in which she always won, though only by a small margin. Extraordinary pains had been taken to keep her lines secret. The ship yard where she was built had been guarded day and night by armed men, no stranger had been admitted under any pretext whatever, and she had been launched "in petticoats," which concealed her hull entirely.

For once the "yellow journals" of the metropolis, had been beaten in their efforts to learn the details of her shape. It was not until the day before that set for the first of the races, that one of the sensational New York newspapers announced under scare heads that the "Virginia," despite her enormous sail area, drew only fifteen feet of water. Hence, the paper deduced the alleged fact that if the wind reached a velocity of even twelve miles an hour, the American boat would inevitably capsize. The English yacht, it asserted, going down deep in the water and ballasted by a lead keel of enormous weight, would stand up against a breeze which would overturn the Virginia—unless Mr. Burke had discovered some new principle of stability.

The other papers at once ridiculed these statements, showing that the Virginia stood up "as steady as a church," under a full press of sail in a 20 knot breeze during her trials with the Columbia. Hence, they maintained, it was ridiculous to state that the Virginia could draw only 15 feet.

The first two races went off splendidly for the Americans, the Virginia coming in a good five miles ahead of her rival, in spite of the fact that the latter also showed phenomenal speed. By the morning of the third race, the yachting world had settled down to the conviction that Mr. Burke had discovered some new principle of hull building and that to this the triumph was due.

The result of the third race seemed so absolutely certain that Stanhope invited Miss Wentworth and her chaperone to be on board during it. He had intended to watch the race from the steam yacht that carried Miss Wentworth, but it occurred to him that the chance when "the moment carried her away" was much more likely to come on board the defender than on any other vessel. It was not in accordance with racing customs to have any one besides the officers and crew aboard at such a

time, but the superiority of the Virginia was so evident that it seemed impossible for harm to result.

And none did result until after the race was won. As the Virginia glided smoothly across the line, four miles ahead of her outclassed rival, Stanhope turned to Miss Wentworth. "Are you carried away—Virginia?" he asked. The girl turned to him, joy in his triumph flushing in her face, but before she could answer a cry of terror arose. The excursion fleet, wild with excitement over the unprecedented triumph of the American, had broken through the guard lines and borne down upon the racers with wildly screaming whistles. The next instance, came a grinding crash and the paddle wheel of a gigantic ferry boat went tearing across the yacht, ripping her stern to pieces and pushing her beneath the water.

The suddenness of the calamity added to its awfulness. One moment the beautiful vessel, with towering masts and bellying canvass was there; the next, only a confusion of broken timbers and struggling men.

As the boat went down like a stone, Stanhope clasped Virginia in his arms and sprang overboard, and in a few moments they were picked up without sensible injury to either. There were plenty to aid and no lives were lost. But the yacht was gone.

Putting Miss Wentworth under care of her friends, Stanhope hurried on board of the United States gunboat which had quickly dispersed the fleet and taken charge of the wreck. "Captain Edward," he exclaimed, hoarsely, "I am Mr. Stanhope, owner of the Virginia. My entire fortune is in that yacht. She contains over six million dollars in gold."

"Good God!"

"Her keel is of solid gold. You read the story in the paper the other day stating that the Virginia drew only 15 feet of water. Well, that was true. Gold is nearly twice as heavy as lead; a golden keel is only half the size of a leaden one, and its resistance to the water is far less. Consequently, a boat with such a keel is much faster than one with the ordinary lead keel. I had to win this race; it was everything to me. So I sold all my property and turned it into gold to make a keel for the Virginia. The hurried sale cost me one-fourth of the value of the property, and every cent I have in the world above the expenses of the yacht lies now beneath the water. Will you stay here and protect the wreck until we can get the wrecking apparatus?"

"I will, sir, I will. But tell me, what possible cause could have induced you to spend some four million dollars on this race?"

Stanhope blushed. "Only a woman, Captain," he said, "only a woman, but I'd spend four millions more to make sure of her."

But the Captain turned away. "Oh Lord!" he grunted.

Three hours later the work on the yacht had proceeded far enough to make certain the safety of the gold, and Stanhope set off to the home of Miss Wentworth, where he found her none the worse for her cold bath.

"I asked my question at the proper time, Virginia," he said, "but the blundering of that boat robbed me of my answer. Will you give it to me now. Did the moment carry you away?"

Shyly the girl looked up at him. "No," she said. "The moment didn't, but—I think that you did."



## MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been recently procured through the Patent Soliciting Department of E. G. SIGGERS., Washington, D. C.

Anthony J. Jameson, Bryan, Ohio, Tilting Table.—This is an exceedingly unique as well as useful invention. It comprises a table made of several sections which are so arranged and mounted that they may be joined in the same horizontal planes so as to serve as an ordinary table, or they may be adjusted to different planes so as to form a series of shelves, or arranged vertically so that they are completely out of the way.

Joseph C. McCollum, Bloomfield, Mo., Pea Vine Cutter.—This invention comprises a vertically reciprocating cutter arranged at the outer end of the ordinary cutter bar of a mower, so that long material, such as pea vines and clover, may be cut vertically so as to divide the swathes made by the mower and thus facilitate the harvesting thereof.

William H. McDonald, Cleveland, Ohio, Combination Cuff Holder and Button.—The employment of ordinary cuff holders is objectionable because they interfere with free arm movement and they are liable to catch in the coat or mutilate the shirt sleeve. The present invention overcomes these objections. It consists of a combined wristband and cuff holder comprising a headed stud as a male member and an expansible eyelet open at both ends as a female member, adapted to receive the headed stud and thereby separably couple the two members together.

George W. Peterson, Leonardsville, Kansas, Door Bell.—This is another novel device. The knob is utilized as the door bell, the inside knob containing the operating mechanism and the outside knob being provided with a push pin. Besides the uniqueness of the idea, it dispenses with the cost of a separate bell mechanism.

William B. Smith, Murray, Ala., Measuring Machine.—In the present invention, a very simple and reliable mechanism is provided, whereby cloth, lace or other fabrics may be automatically measured and registered, showing the amount of material unwound from the bolt or roll, either for aid in making a sale or for taking stock in a store.

Gaston C. Lewis, Bayard, Fla., Design for Insect Trap.—This device is intended to be placed upon the leg of the bedstead to prevent insects ascending the same. It comprises a circular concavo-convex shell, having a convex upper side and an inwardly-curving pendent rim, which curls into a plurality of interior convolutions. An insecticide is placed therein so that it is absolutely impossible for an insect to pass across the device.

Thomas L. Emery, Hallowell, Me., Guide for Stone Channeling Machine. The present invention consists of a drill-guide, disconnected from the drill or any part of the stone channeling machine and insertible in the last of a series of holes formed in a stone by a drill. The guide has a flattened face against which the drill is adapted to rotate and travel, whereby the opening formed by the drill will intersect with the opening in which the drill-guide is inserted.

John E. W. Fogal, Quincy, Ill., Elevator Gate.—This is an important improvement in these gates and includes novel actuating means for automati-

cally opening and closing the gates of an elevator shaft as the car respectively approaches and leaves the floors at which they are located. The mechanism is reliable and there is nothing to get out of order.

Alvah M. Griffin, Clifton, Kansas, Acetylene Gas Generator.—This generator comprises a minimum number of parts, which can be readily taken apart and assembled. The construction is especially adapted for use in street lighting and comprises novel means for housing a generator and placing it close to the lamp post, one of the generators being provided for each lamp.

Alexander B. B. Harris, Bristol, Tenn., Cistern Cut-off and Filter.—This is an automatically operating device having the parts so constructed and arranged as to provide for draining the dirty water and trash from the roof for a length of time proportionate to the amount of rainfall and size of the roof, before any water is permitted to be delivered into the cistern. The device possesses many advantages and is a great improvement.

Willie W. and Quincy A. Mercer, Bowling Green, Ohio, Oil Well Pumping Jack.—By means of this construction all lateral movement on the plunger rod is removed and the sucker rod may be withdrawn or the mechanism adjusted without dismantling the pump. At the same time the device is simple and inexpensive.

Lewis M. Pratt, Belleville, Kansas, assignor of 1-2 to Arnold G. Miller, Fowl Decapitator.—A closed box is provided with an opening and a knife is arranged to be sprung across the opening when released from a trip that is operated by a fowl forcing its head through the opening. A fowl is placed within the box and will attempt to force its way through the opening, springing the trip, whereupon the knife will sever the head from the body. By this means it is unnecessary to handle the fowl during the execution thereof and all the convulsions take place out of sight.

John A. Brown, Ionia, Iowa, Straw Stack Former.—This is a device that will be appreciated by threshers throughout the country. It consists of a canvas wall so constructed that it can be easily placed in position and not only absolutely prevents the straw being spread over a large area but insures its proper piling into a stack.

Dr. Elias H. Cowan, Oakalla, Texas, Well Cleaning Machine.—This is a simple and inexpensive mechanism comprising windlasses and pulleys which can be mounted upon a wagon bed or truck and by means of which accumulations in the bottom of wells may be loosened and removed. The device is so arranged that it may be operated by hand or horse power.

Henry Leeper, Canton, Ill., Ring Divider.—The present invention is a simple little device adapted to be applied to a terret or harness ring so as to hold the reins or straps straight and effectually prevent their becoming twisted and also to prevent the buckles from drawing back through the rings. It will become popular as it avoids many of the objections to the common rings. Another advantage is that it may be applied to any size ring and may be removed when desired.

Henry McMackin, Saybrook, Ill., Combined Grinding and Drilling Machine.—This is an exceedingly practical device specially adapted for farmers and mechanics. It comprises a frame which carries a hand operated driving shaft. This shaft is provided

with grinding disks whereby harrow disks, sickle knives and the like may be ground. The end of the shaft carries a drill chuck by means of which the device may be easily transformed into a drilling machine.

Hans P. Nielson, Alameda, Cal., Acetylene Gas Generator.—A generator is provided in which the calcium carbide serves not only to generate the gas when attacked by water but also as a dehydrating medium for the gas. A further advantage lies in an alarm mechanism by which a signal is given when the carbide is expended, the water being shut off from the carbide at the same time.

James W. Owen, Ithaca, N. Y., Bicycle Brake.—In this device a very simple brake is provided that is absolutely reliable in action. It comprises a brake shoe having an operative connection with the front sprocket wheel of a bicycle so that when the pedals are reversed the brake will be applied to the wheel. The device is made of but few parts and can be constructed at comparatively slight cost.

Edgar C. Wiley, Lynchburg, Va., Device for forming Beads in Molds.—Heretofore it has been found very difficult to form the bead in sand molds for pipes, but this difficulty has been overcome by the present invention, which provides a bead-forming member arranged on the end of the pattern and operated by a shaft which has a concentric and an eccentric portion which may be operated so as to throw the bead-forming member into and out of operation, this member being completely out of the way while in the latter position.

David D. Low, Nittayuma, Miss., Design for Bale Buckle.—The present device is an exceedingly inexpensive and practical device. Its leading feature resides in an approximately rectangular plate provided in diametrically opposite edges with reversely inclined notches, and having spaced holes for the reception of bale wires which are passed through the same and looped about the notches.

Jerome G. McGaughey, Spokane, Washington, Nail.—This invention relates to a nail adapted to be inserted in the heel of a shoe to prevent its edge from wearing down. It consists of a shank, the upper end of which is provided with a T-shaped head and is adapted to be driven flush with the face of the heel. A plurality of these form a wear-plate and will thus do away with the necessity of the attachable plates now commonly used.

Ira L. Baker, Coalgate, Indian Territory, Neck Yoke Attachment.—A loop is provided, the ends of which are secured together by a connecting plate. A roller is loosely mounted between the connected ends, and adjacent to the connecting plate. This provides an attachment which may be readily applied to any ordinary neck yoke, in which the strain of the hames-strap shifts with the pull irrespective of the line of draft. By this means the pull on the attachment becomes direct and the edges of a hames-strap are not subjected to wear.

Godfrey H. Cline, Clark, Washington, Ore Separator and Amalgamator. This is a machine especially adapted for use in cold climates, such as Alaska, and comprises means by which the frozen gold-bearing earth may be disintegrated by the action of heat, washed mechanically, and subjected to the action of mercury in order to thoroughly collect all the small particles of gold. It consists of an endless chain of amalgamators which convey the gold bearing solution close to a heating furnace, thus preventing freezing, and keeping the mercury at a

temperature which promotes its affinity for the precious metal to be collected.

Angus and John H. McLeod, Marietta, Kansas, Grain-weighing Machine.—This invention is an automatic grain weigher, whose principle idea is a novel construction which permits a ready flow of grain or material for a time and then partially cuts it off, so that but a very small stream runs into the receptacle as the poising point is neared. The instant the weighing receptacle receives its full charge, the feed is entirely cut off and more than what is necessary to counterbalance the scale weights is prevented from being discharged into the receptacle. A further feature of the invention resides in novel means for registering the amount of grain so weighed.

George T. Moore and Edward S. Shoup, Houston, Texas, Writing Desk.—The idea of this invention is to provide a desk for use in public places which will display advertisements in a most conspicuous manner. It consists of an ordinary writing desk having a glass or transparent surface beneath which is arranged suitable advertising matter, the whole forming a decided novelty in this line.

James P. Pittman, Beaumont, Texas, Cheese Cutter.—By means of the present device the proper amount of cheese to be cut may be readily and accurately determined. It consists of a rotatable table upon which the cheese is placed, and an indicator mounted alongside of the table and having a movable pointer which will show upon the table the line of cut according to the weight of the cheese desired.

James W. Scott and Sumner A. Leach, Warren, Maine, Attachment for Carding Machines.—These inventors provide an electric alarm which includes a novel switch that is held in open position by a sliver passing into the card. When, however, the sliver is broken from any cause, the switch will automatically close the circuit, ring the alarm and notify the attendant of such breakage.

Henry A. DeChenne, Sorento, Ill., Fence Making Machine.—The purpose of this machine is to weave the wires about the vertical pickets of a fence. It comprises an exceedingly practical device in which all the parts are greatly simplified. Suitable provision is made for any number of strands, and these can be spaced at any desired distance apart.

George W. Hedrick, Dayton, Va., Axle Collar Washer.—The object of this invention is to provide a collar which will prevent the wear upon the sand collar at the inner end of the axle spindle. It consists of a washer of flexible material comprising a shoulder or flanged portion and a rim portion adapted to be pressed into interlocking engagement with the sand collar to retain it in place on the axle when the wheel is removed.

Noah Shaw, Eau Claire, Wisconsin, Domestic Heating Vessel.—An outer casing is provided within which depends a vessel adapted to contain the material or liquid to be heated. This inner vessel is secured to the outer casing by means of a flange at the upper end of the latter, which is provided with a plurality of vent openings. By this construction, not only the bottom of the vessel, but nearly the entire sides are subjected to the heat.

Joseph H. Miller, Oklahoma, O. T., Design for Churn Dasher.—The feature of this design is a tubular stem through which the handle of the dasher passes, and which is encircled by a series of spaced parallel inverted cup disks. This provides means whereby the contents of the churn may be thoroughly agitated.



**A** CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE, which keeps inventors and manufacturers posted in the art in which they are mostly interested.—The full address of any patentee, and number of patent found below sent to any address on receipt of one 2-cent stamp.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings upon receipt of 10 cents per copy; twenty copies for \$1.50.—Address THE INVENTIVE AGE PUBLISHING CO., 918, F St. N. W. WASHINGTON, D. C.

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Garment-supporter.....J. V. Washburne  
Gas engine. Explosive.....G. W. Starr et al  
Gas-generator.....G. Woods  
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Same.....W. M. Crow  
Same.....W. E. Scofield  
Same.....J. E. Wormald et al  
Gas-holder.....T. W. Marsden  
Gas-mantles. Reinforcing incandescent.....O. M. Thowless  
Gas-vending machine. Coin-controlled.....W. Webber  
Gate.....G. O. Culver  
Gate.....W. N. Simpkins  
Gear. Reversing.....E. S. Sloan  
Gearing. Worm.....C. M. Jones  
Glass-blower's machine.....C. A. Dunbar  
Governor. Marine-engine.....J. Weir  
Grain-cleaner.....J. P. Adams  
Grain-sack holder.....J. A. Eddy  
Grate-frame.....W. G. Harlow  
Grater.....E. Crupe  
Gun. Pneumatic.....E. M. Goldsmith  
Hammer. Power.....L. D. Howard  
Handle-bar. Adjustable.....E. M. Landis  
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Hasp-fastener.....N. Milam  
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Heat into work. Converting.....F. Burger  
Hoist. Fluid-pressure.....N. A. Christensen  
Horseshoe. Adjustable nailless.....H. R. Fenley  
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Hot-air furnace.....C. Olsted  
Hydrocarbon-vaporizing burner.....S. A. Politsky et al  
Incandescent mantle.....O. M. Thowless  
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Incubator egg-tray.....J. L. Cousins  
Indigo-white and making.....A. J. Stiegelman  
Indigo-white compound and making.....M. Razien  
Inhaler.....P. T. Donovan  
Ink. Making.....D. J. Ogilvy  
Ironer. Collar edge.....G. Binder  
Journal-box dust-guard.....F. Brown  
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Knitting-machine. Knot-actuated stop.....W. Green  
Lamp. Acetylene-gas.....E. Hoffmann  
Lamp-bracket.....B. F. Kent  
Lamp. Electric-arc.....T. E. Drohan  
Lamp. Electric-arc.....2 pats.....J. Meizer  
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Lamp. Suspension.....W. Fahndrich  
Lamp. Vapor-burning.....W. Mitchell  
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Latch.....W. F. Herdrich  
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Level. Spirit.....C. L. Newton  
Life-preserver.....L. S. Bickley  
Linotype-machine.....J. H. Lynch  
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Lock.....S. Nelson et al  
Locomotive-frame.....D. A. Wightman  
Locomotives, &c. Handling.....W. R. Wood  
Loom.....G. F. Hutchins  
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Magnesia-alumina. Making.....M. E. Rothberg  
Mail-box.....O. H. Orendorf  
Mail-sack catching mechanism.....M. D. Cummings  
Maure-distributing machine.....W. Jager  
Match-box.....M. Epstein  
Match-machine.....F. L. Van Dusen  
Measuring areas. Machine for.....J. E. Nightingale  
Measuring device.....A. B. Pratt  
Measuring, marking, and rolling machine. Cloth.....R. Livingston et al  
Meat. Curing.....G. A. Washburn  
Meat-curing apparatus.....Same  
Mechanical movement.....J. Schies  
Merchandise. Means for collecting, conveying, and depositing articles of.....L. Abraham  
Mercury. Oxide-hydro of.....R. Torchia  
Mosquito guard. Portable.....H. A. Strauss  
Mower grass-carrier.....R. F. Krause  
Music-box star-wheel mechanism.....G. Diezemann  
Musical instrument. Mechanical.....G. A. Brachhausen  
Nozzle. Exhaust.....W. R. Frederick  
Nozzle. Vent.....A. N. Ritz  
Nut and bolt lock.....C. M. Tipton  
Nut-lock.....M. L. Moran  
Nut-lock.....M. L. Shively  
Nut-lock.....J. J. Simons  
Nut-lock wrench.....W. E. Ball  
Oil-can.....T. W. Alexander  
Ores, &c. Apparatus for concentrating and separating.....J. Buss  
Packing-box.....J. H. Harrington  
Packing annular joints.....B. C. Batcheller  
Packings. Carton or shipping-package for piston.....A. B. Pratt  
Paper. Apparatus for corrugating.....J. T. Ferres  
Paper box.....J. A. Wagnitz  
Paper-box-blank-maker.....H. Inman  
Paper box or lid.....F. Knobloch  
Paper-pulp-screening vat.....H. E. Wambold  
Paper trimming, pasting, and matching machine. Wall.....W. D. Taber  
Pedal-rubber.....F. T. Robinson  
Pen, &c. Cattle.....H. Wood et al  
Pen. Fountain.....A. T. Cross  
Penholder.....G. C. Ward  
Phonograph.....W. Bohne  
Piano-action instrument.....T. Cahill  
Piano repeating action. Gaud.....A. Nickel  
Pile-spreader.....T. J. Stearns  
Piping-joint.....J. W. Wiggins  
Pith and fiber of cornstalks. Apparatus for separating.....S. Dyer  
Planter and fertilizer-distributor. Combined.....A. H. Wootten  
Planter. Automatic check-row corn.....L. J. Lindsay  
Planter. Check-row corn.....L. J. Lindsay  
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Precious metals. Separating.....H. de Raasloff  
Preserving apparatus.....W. A. Sheldon  
Printer's furniture. 2 pats.....W. G. Slanson  
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Printing. folding, and delivery mechanism.....G. R. Willis  
Projectiles. Buffer-block for illuminating.....R. T. Phillips  
Propeller-wheel.....C. E. Johnson  
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Pump. Motor.....W. H. Eads  
Punching, shearing, and shaping machine.....P. Lord  
Rail-joint.....W. A. Moreland  
Rails. Preventing creeping.....J. L. Pope  
Railway. Closed-conduit electric.....2 pats.....L. Dion  
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Railway-signal system. Automatic.....J. W. Lattig



Railway switch.....G. H. Fairchild  
 Railway system, Electric.....E. Frischmuth  
 Railway-tie.....E. A. W. Jetteries  
 Ratchet-wrench.....A. Peterson  
 Razor-blade safety attachment.....L. Flinker  
 Refrigerator-car ventilating-hatch.....  
 Register.....H. M. McIntosh  
 Register.....W. L. Carter  
 Rein-guide.....C. E. Whitcomb  
 Relay, Static.....J. Kitsee  
 Rheostat-controller.....J. Dillon  
 Riveter, Pneumatic.....H. H. Prange  
 Road-making machine.....S. T. Williams  
 Roentgen-ray apparatus.....W. S. Andrews  
 Rotary engine.....A. H. Gould  
 Rubber, gutta-percha, &c. Treating india-  
 Rubber sole.....E. Hornung et al  
 Rubber stamps. Manufacture of endless  
 bands for.....G. A. Pickup  
 Safety-pin.....J. D. Conover  
 Sandpapering-machine, 2 pats.....J. L. Perry  
 Saw.....R. Dale  
 Saw-blade.....H. H. Bickford  
 Sawmill steam-feed.....H. G. Dittbenner  
 Scaffold.....G. Curley  
 Scale, Carpenter's.....C. Larsen  
 Scale, Proportionate.....G. R. Brown  
 Scraper, Wheeled.....J. Stubbs  
 Screw-driver attachment.....E. L. Schneider  
 Screw-machines. Automatically clamping  
 and locking turrets to.....J. Jetter  
 Sewing-machine, Blind-stitch.....M. Spitzer  
 Sewing-machine, Hemstitching.....  
 2 pats.....G. H. Dimond et al  
 Sewing-machine motor attachment.....  
 Sewing-machine spring motor.....J. R. Oliver  
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 Shade-holding mechanism.....G. H. Forsyth  
 Shirt, Apparel.....C. F. Miller  
 Shoe.....C. De Leo  
 Shoe tongue-piece.....E. H. Christensen  
 Shovel.....W. S. Judd  
 Shovel-board.....E. K. Hayes  
 Shutter-fastener.....W. D. Stansbury  
 Shutter-slat-operating device.....P. Starek  
 Shutter-worker.....S. L. Powell  
 Sign.....W. Heeren  
 Skirt-supporter and waist-holder, Com-  
 bined.....J. C. Kimsey  
 Sliding gate.....L. A. Cooper  
 Smoke-consuming furnace.....E. Thornton et al  
 Sprinkling device.....J. W. Sanderson  
 Stalk-cutter.....J. Hamm  
 Stamp, Hand.....J. F. Lehner  
 Stamping machine, Relief.....F. Waite  
 Stanchion, Cattle.....S. A. Curtis  
 Stave-trimming and planing machine.....  
 Steam-engine.....L. N. Holm  
 Steam-trap.....J. L. Chapman  
 Steamer, Chainless continuous-fabric.....  
 Stone, Making artificial.....S. Schongard  
 Street and station indicator.....H. R. Miller  
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 Submarine apparatus.....A. von Hoffmann  
 Subway construction.....H. B. Camp  
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 Swing, Chair.....W. S. Witter  
 Syringe.....W. P. Allen  
 Telegraphy receiving device.....2 pats.....  
 Telegraphy, Wireless.....2 pats.....J. Kitsee  
 Telephone-lines from deleterious electrical  
 charges. Means for relieving.....C. H. Arnold  
 Telephone switching apparatus.....D. S. Hulsh  
 Telephone system, Central-battery.....  
 Telephone-system plug and socket.....  
 Telephone-transmitter-arm.....G. R. Kennedy  
 Telephone trunk-circuit.....D. S. Hulsh  
 Tender-coupling.....E. W. Palmquist  
 Thermostat.....H. E. Reeve  
 Thill or pole coupling.....J. C. Perkins  
 Thresher and cleaner, Pea.....S. H. Williams  
 Threshing-machine feeder attachment.....  
 Tide-motor.....J. Nagler  
 Tiles, Manufacturing dovetailed.....  
 Time-indicating device.....H. King  
 Time-recording system.....P. G. Giroud  
 Tire.....W. H. Mitchell  
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 Tool, Combination.....A. L. Schultz  
 Train-control system.....Reissue.....  
 Trolley.....E. W. Rice, Jr  
 Trolley-catcher.....J. E. Connolly  
 Trolley-track.....F. J. Fairchild  
 Trolley-way, Elevated.....T. C. Prouty  
 Truck anti-friction-bearing.....E. C. Jones  
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 Type-machinery ejecting mechanism.....  
 Type-writer-cover-fastening device.....  
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 Type-writers, Ribbon-feed for.....  
 Type-writing or other keyboard instru-  
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 Type-writing machine.....W. J. Barron  
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 Type-writing machine.....R. J. Fisher  
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 Vapor-tube heater.....Reissue.....A. Kitson  
 Vaporizing attachment for burners.....  
 Vehicle driving mechanism.....L. L. Hammond  
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Washing-machine.....B. Freedman  
 Wash-tub, Stationary.....E. C. Brunner  
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 Water-elevator, Compressed-air.....  
 Water-gage guard.....T. J. Demorest  
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 Watering trough, Automatic hog.....  
 Weaning device, Calf.....H. Zimmerman  
 Weighing apparatus, Automatic.....  
 Wheel resiliency device.....W. E. Nickerson  
 Windmill.....G. Hayes  
 Windmill-pump connection.....J. W. Jaycox  
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 Wrench.....C. B. Ketchum  
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 Air-brake.....E. Gobbe  
 Air-brake, Vehicle.....J. A. Nef  
 Air compressing machine.....W. J. Donaldson, Jr  
 Album, Easel.....A. Bouvier  
 Asphaltic composition powder, Making.....  
 Atomizer.....C. Jaeger  
 Attrition-mill.....W. W. Varney  
 Automobile vehicle.....E. L. Smith  
 Axle box, Car.....A. Heine  
 Axle-gage.....L. H. Dyer  
 Axle-gage.....T. J. Morgan  
 Axle-gage.....B. F. Knobloch  
 Badge or button, Campaign.....W. H. Luther  
 Barrel.....R. W. Baylor  
 Bath-tub seat.....E. T. Brown  
 Battery plate, Secondary.....W. Bowker, Sr  
 Bearing, Disk.....C. A. Latham  
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 Bed-bottom, Spring.....H. E. Laughlin  
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 Berth.....W. A. Brown  
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 controlling excitation of.....J. Appleton  
 Boring-machine.....A. Z. Savage  
 Bottle, Non-refillable.....W. C. Curtiss  
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 Bridge-alarm.....R. J. Barry  
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 Buckle.....J. R. Smith  
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 Burglary, Protection against.....A. Petternel  
 Bushing-protector for use in pitching lager-  
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 Can.....G. W. Bingham  
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 Car-coupling.....W. C. Gregg  
 Car-door.....D. Arenson  
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 Car, Dumping.....J. B. Rhodes  
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 Cash-register.....H. L. Jessen  
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 Cellulose, Manufacture of.....A. E. Vorreiter  
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 Cheese-cutter, Calculating.....H. G. Roth  
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 Clock, Geographical.....A. G. Eganisne  
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 Cornice-hanger.....O. B. Hellstrom  
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 Cotton-gin, Roller.....J. W. Graves  
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 Cultivator, Hand.....H. R. Fowler  
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 Curtain-fixture bracket.....C. A. Whren  
 Cycle driving mechanism.....  
 Cylinder-lock.....F. J. E. Johansson  
 Dock, Floating dry.....E. von Marsowszky  
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 Pipe cleaner, Flexible waste.....R. W. Marek  
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 Pipes, Combined union and elbow for  
 coupling.....G. W. Kellogg  
 Pipes or cocks to fluid mains, Means for  
 coupling.....G. H. Thomas  
 Piston.....F. Albrecht  
 Pitman connection.....W. Heston  
 Planter, Corn.....D. C. Lingenfelter  
 Planter, Corn.....P. J. A. van Deinsse  
 Planter, Cotton-seed.....J. H. Wolfe  
 Planter guide-marker.....C. E. Smith  
 Planting machine, Potato.....J. Ryan  
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 Plow, Sulky.....2 pats.....E. Fowler  
 Pneumatic-despatch-tube system.....C. R. Davis  
 Printing-press.....A. W. Pearsall  
 Printing-press attachment.....R. Miehle  
 Printing-press attachment.....M. Snyder  
 Printing-press counting device.....J. W. Leary  
 Printing-press sheet-counting device.....  
 Printing rollers, Mold for casting wall-pa-  
 per.....E. C. Baek  
 Printing-stamp.....J. W. Adams  
 Propeller, Reversible.....A. A. Williams et al  
 Pulverizer.....J. Davison  
 Pump.....F. Edwards  
 Pump, Air-actuated.....F. Z. Bartell  
 Pump-valve-actuating mechanism.....  
 Punch.....G. B. Petsehe  
 Radiator construction.....C. P. Vernier  
 Radiator construction.....C. T. Pratt  
 Rail-joint.....T. C. Clarke  
 Rail-joint.....W. J. Whitaker et al  
 Railway conductor and collector, Electric.....  
 Railway-frog, Automatic.....A. Petzenburger  
 Railway-rail and joint.....C. W. McKinney  
 Railway-rail electric bond.....S. Hazard  
 Railway-rail joint.....H. P. Brown  
 Railway-rails, Ice-removing mechanism for  
 .....J. F. Seullen  
 Railway signal, Electric.....J. J. Shirkey  
 Railway-spike.....G. H. Dunham  
 Railways, Ice-removing trolley for electric  
 .....B. M. Chase  
 Raisin-cleaner and cap-stemmer.....J. J. Shirkey  
 Range, &c.....H. Eastwood  
 Ratchet-wrench.....A. W. Hawkins  
 Rate meter, Multi.....T. Carter et al  
 Reflector, Light.....2 pats.....E. Oxley  
 Register.....F. Egnell  
 Register.....C. F. J. Wernert  
 Resins, waxes, &c. Raising the melting-  
 point of.....A. Gentzsch  
 Rheostat, Electrical.....H. W. Leonard  
 Riveting-machine.....C. H. Johnson  
 Rock-breaker, Subaqueous.....B. H. Coffey  
 Roller-press.....E. Reagan  
 Rolling machine, Tube.....C. L. Curtis  
 Rotary engine.....E. P. Couture  
 Rotary engine.....G. E. Ledvina  
 Rotary engine.....J. E. Moats  
 Sack-holder.....G. H. Carney  
 Saddle, Harness.....P. Maegaard  
 Safety-pin.....R. Martin  
 Sand-band.....A. M. Ingessoll  
 Saw-guard.....T. David  
 Saw-sharpening machine.....G. Bartlett  
 Saws, Insertible cutter for rotary.....  
 Scale for cheese, Cutting.....J. H. Jewett  
 Scrubbing-machine.....H. C. Roth  
 Seal-lock.....H. C. Burk  
 Secondary battery.....G. W. Lewis  
 Seeder, Force-feed end-gate.....A. Jamieson  
 Sewing-machine.....I. D. Stevens  
 Sewing machine, Buttonhole.....W. Shaw  
 Sewing machine, Buttonhole.....W. F. Jagielski  
 Sewing-machine guide.....P. R. Irvine  
 Sewing-machine, Revolving-hook.....A. Doring  
 Sewing-machine work-clamp, Buttonhole.....  
 Sharpener, Shears.....J. T. Hogan  
 Shoe-holder.....K. Rossler  
 Shoe-holder.....E. A. Wilcox  
 Shoe-stretcher.....C. W. Crozier  
 Sifter, Ash.....S. D. Melvin  
 Skate.....H. Handwerk  
 Skate, Roller.....F. A. Ross  
 Snow-plow.....W. H. Tagert  
 Stamping-machine.....W. Kraemer  
 Steam-boiler.....C. D. Moshier  
 Steam-engine for pumps.....J. E. Normand  
 Stoking device.....J. Wezel  
 Stone base, Artificial.....L. K. Forsythe  
 Storage or show case.....W. R. Kinnear  
 Stove, Knockdown camp.....D. B. Warren  
 Stove or range fire-box lining.....  
 Stovepipe attachment.....E. V. Coulston  
 Switch-operating apparatus.....H. C. Armitage  
 Syringe or other cap, Fountain.....M. W. Brown et al  
 Telephone signal and jack, Combined.....G. H. F. Schrader  
 Temperature-regulator, Automatic.....O. R. Cline



Test specimens. Holding device for tensile.....A. Roesch  
Tin and zinc from scrap. Apparatus for reclaiming.....G. B. Cruikshank et al  
Tire. Rubber vehicle.....R. B. Price  
Tire-valve and cap.....2 pats.  
Tire-vehicle.....G. H. F. Schrader  
Tooth. Artificial.....E. Pierrepont  
Tooth-shell splitter.....C. M. Wilcox  
Train-order signal.....H. De Wallace  
Train-signal device. Electric.....J. F. Scullen  
Trestle. Knockdown.....L. W. Davidson  
Trolley-head.....S. Bourgeois  
Truck. Passenger-car.....J. C. Barber  
Tub-compressor.....J. J. Jessup et al  
Turbine. Steam.....R. Schulz  
Type-containing channel.....L. K. Johnson et al  
Type-setting apparatus.....L. K. Johnson et al  
Undershirt and suspensory bandage.....F. W. Wright  
Unloading apparatus.....J. W. Reese, Jr  
Valve. Air-controlling.....E. L. Rowe  
Valve-gear. Locomotive-engine.....G. B. Eddy  
Valve-operating mechanism.....J. W. Brannon  
Vehicle. Motor.....2 pats.  
Vehicle. Motor.....J. C. Coleman  
Vehicle. Motor.....F. E. Stanley et al  
Vehicle. Pneumatic-tired.....J. M. Wolbrecht  
Velocipede driving-gear.....J. Cottrell  
Vent. Cask.....J. Wabi  
Vinylidacetone-alkamids and making. Compound of.....A. Schmidt et al  
Wagon chafing-roller.....R. E. Hall  
Wagon-clip m'f'g-machine.....J. H. Baker  
Wardrobe.....D. R. Dix  
Washing-machine.....J. W. Clayton  
Washing-machine gearing.....C. H. Shaffer  
Water-closet tank.....A. W. McGahan  
Water-gate.....H. A. Icke  
Water-heater.....T. P. Shaw  
Water-hoist.....T. H. Tise et al  
Water-motor.....E. Everson  
Water-tube boiler.....3 pats.  
Water-tube boiler.....J. M. Platt  
Water-tube boiler.....J. M. Searle  
Weighing-machine.....C. F. Wood  
Weighing-machine. Automatic.....D. S. Cook  
Wheel.....A. G. Ramage et al  
Wheels. Making vehicle.....H. F. Condon  
Whiffletree.....J. M. Conrad  
Whist tray. Duplicate.....R. Ihling  
Window.....M. Haberie  
Window-cleaning chair. Folding.....L. Bulasky  
Wire-spring-coiling machine.....S. Kirk  
Wooden dishes. Machine for making.....G. A. Ensign  
Wrench.....R. Hayden  
Wrench.....R. S. Spanliding

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Air compressor and cooler.....O. P. Ostergren  
Air for industrial purposes. Reheating compressed.....T. A. Edison  
Andirons and screen. Safety.....I. W. Sullivan  
Angle chair or fitting.....G. A. Weber  
Armature for multipolar dynamos.....J. J. Wood  
Baby-walker.....D. S. Settemyre  
Back-pedaling brake.....W. J. Lloyd  
Balance sheet. Trial.....L. H. Johnson  
Bale-tie.....C. E. Mallett  
Baling-press.....W. D. Watkins et al  
Bath-tub seat.....H. L. Gimmell  
Bed.....E. E. Munger  
Bed-lifting device. Hospital.....E. E. Munger  
Bed-slat.....J. D. Edwards et al  
Belt-tightener.....2 pats.  
Bicycle-brake.....C. Colahan  
Bicycle-stand.....W. H. Parsons  
Bicycle-stand.....C. W. Warner  
Bicycle-support.....P. A. Shanklin  
Blanket-fastener.....J. D. B. Murray  
Blowpipe.....F. Speidel  
Boat. Hand-propelled.....D. M. Pfautz  
Book. Manifold sales.....E. M. Wilder  
Boot shock-deadening device.....J. M. Cartier  
Bottle.....G. W. Vought  
Bottle-carrier.....E. H. N. Clarkson  
Bottle-filling-machine corking.....G. W. Field  
Bottle. Non-refillable.....P. J. Germain  
Bottle. Non-refillable.....F. J. Gottlieb  
Bottle. Non-refillable.....W. A. Hall et al  
Bottling-apparatus filling-head.....2 pats.  
Box-making machine.....J. S. Stokes  
Bread-raising apparatus.....J. D. Bell  
Brine. Purifying.....G. N. Vis  
Briquets for testing purposes. Machine for making.....T. Miller, Jr  
Buckle. Meat.....S. A. Morgan  
Buckle.....I. W. Levi  
Buckle and snap-hook. Combined.....W. W. Semple  
Buggy-top-folding device.....L. L. Short  
Bung. Barrel.....G. Smyth  
Bunial. Preventing premature.....C. A. Dietrichs  
Burial-casket.....P. Herbold, Jr  
Bushings. Faucet.....T. Pendergast  
Button. Upholsterer's.....J. A. Young  
Cable-grip.....G. C. Niles  
Calculating instrument.....R. W. Conant  
Calendar.....A. W. Steiger  
Calendar.....A. Zachrisson  
Camera. Roll-holding.....M. Jnruck  
Cane and tripod. Combined.....W. H. MacGill  
Car.....G. A. Dunn et al  
Car.....C. Roehr  
Car-bolster.....H. C. Williamson et al  
Car-brake.....F. Theilengerdes  
Car-brake lever.....J. C. Westerfield et al  
Car-brakes. Regulator for.....J. Georgoff  
Car-coupling.....W. F. Richards  
Car false floor.....G. J. Santa Crnz  
Car journal-box key.....A. M. Watt et al  
Car. Railway.....W. T. Van Dorn  
Cars. Sign for street.....T. Millen  
Carbureter.....C. W. Atkinson  
Carbureter.....H. Rey  
Carding-machine stop-motion.....J. Brady, Jr, et al  
Carding machinery. Wool.....J. Leach et al  
Carriage flue construction. Steam.....R. C. Mudge

Casing-spear.....H. R. Hardenburg  
Ceilings. Means for suspending.....G. E. Escher  
Cement-pipe-making apparatus.....C. J. Kielberg  
Centrifugal machine.....W. H. Cook  
Chain.....2 pats.  
Chair.....C. W. Levalley  
Chair.....J. M. Germanson  
Check-hook.....H. H. Brown  
Checkrein-holder.....J. Clyde et al  
Chemical apparatus.....F. R. K. Erfmann  
Circuit-controller.....C. C. Webster  
Cistern-cleaner.....J. T. Hindman  
Cock. Right and left basin.....W. B. Ford  
Coin-controlled mechanism.....R. E. Wickes  
Collar-blank-folding mechanism.....G. Reece  
Compasses and calipers. Combined.....J. H. Hopper  
Concentrator.....J. W. Pinder  
Confectionery sugar-coating apparatus.....W. L. White  
Copy-holder.....B. F. Childress  
Corn and cotton fender.....A. G. W. Foster, Sr  
Cotton-press.....M. Swenson  
Couch. Box.....A. H. Sulser  
Crusher and pulverizer.....T. Shaw et al  
Same.....T. R. Gorth  
Crushing-machine.....2 pats.  
Cultivating fruits.....S. H. G. Stewart  
Curler. Hair.....A. C. Moore  
Curtain bracket. Adjustable.....J. A. Moore  
Curtain-pole bracket.....C. E. Fullerton  
Display rack. Rug.....D. C. Main  
Ditching-machine.....G. Y. McMurry  
Door fan attachment.....P. Peet  
Door-stop.....G. H. Rogers  
Doors. Sliding.....J. H. Phelps  
Draft-rigging.....P. Souther  
Draw-press.....H. Mohr et al  
Drawing-board.....G. K. Rich  
Drying-room.....F. E. Frey  
Duplicating apparatus.....A. B. Dick  
Dust-guard.....S. A. Crone  
Dye and making. Brown cotton.....J. Abel et al  
Dye and making. Brown sulfur.....N. Schwan et al  
Dynamo speed-regulator.....P. W. Alexander  
Easel or other article of furniture. Inter-convertible.....J. H. Milliken  
Electric conductor.....P. C. Sutter  
Electric-conductor joints. Metallic cement for.....W. F. Barber  
Electric-current switch. Alternating.....B. Hopkinson  
Electric furnace.....A. H. Cowles  
Electric machine. Dynamo.....M. H. Hurrell  
Electric meter.....J. Harris  
Electrical-current indicator and recorder. Maximum.....E. C. Rimington  
Embroidering machine.....E. J. Klingenberg  
Engine fuel-oil feeder. Gasoline.....T. C. Kennedy  
Engine lubricator attachment.....W. F. Johnston  
Engine reversing mechanism.....G. W. Anderson  
Extension-table.....P. P. Musser  
Fabric-renovator. Steam.....J. B. Allen et al  
Farm-gate.....G. W. Thompson  
Feed-water heater.....L. M. G. Delannay-Belleville  
Feed-water regulator. Automatic.....C. J. Coleman  
Fence.....E. E. Bateman  
Fence-post.....N. A. Taylor  
Fertilizer and making.....E. Richter  
File-case and index.....I. L. Unterbrink  
Firearm. Magazine.....J. L. Copping et al  
Firearm safety mechanism. Double-action.....M. Bye  
Fire-extinguishing compound.....J. Tombeur  
Fireproof window.....F. Voigtmann et al  
Flooring. Sheet-metal.....F. Voigtmann  
Fluid under pressure. Apparatus for actuating.....R. Conrader  
Flusher. Automatic.....I. P. Clarke  
Fuel. Feeding pulverized.....F. H. Lewis  
Game.....G. W. Krebs  
Game.....R. E. Wickes  
Gas-burner.....O. Wiederhold  
Gas-engine. Rear compression.....G. E. Hoyt  
Gas generator. Acetylene.....A. Husson  
Gas generator. Acetylene.....H. L. Pyle  
Gas generator. Acetylene.....J. W. Weeks  
Gas-lighter. Automatic.....K. von Vietinghoff-Scheel  
Gas-lighter. Electric.....H. de Thiersant et al  
Gas or gasoline engine.....J. J. Simmonds  
Gate.....J. F. Barnes  
Gate-houses. Endless screen for.....G. E. Whitney  
Gearing. Screw.....O. A. Packer  
Glass molding machine.....J. B. Fondn  
Glass-pipe-molding machine.....S. Jones  
Go-cart. Folding.....J. Rosenthal  
Grain drier and cleaner.....C. H. Larsen  
Grain-separator.....A. Heine  
Graphophone-cylinder.....A. N. Petit  
Greenhouse.....K. M. Jennings  
Greenhouse construction.....J. A. Kramer  
Guns. Apparatus for supplying turret or barbette.....A. T. Dawson et al  
Guns. Extractor for priming cartridges.....A. Silfversparre  
Harrow attachment.....J. D. Whitten  
Harvester. Corn.....J. E. Conway  
Hat-finishing device.....E. G. Taylor  
Hinge and storm-window fastener. Combined blind.....R. W. Harlow  
Hinge. Couch-head.....J. T. Seng  
Hinge. Spring.....W. Gerwien  
Hog-trap.....H. N. Smith  
Hoisting apparatus.....H. J. Cook et al  
Hook and eye.....C. Leib  
Horse-arresting device.....J. Arel  
Horse-detacher.....G. W. Creps  
Horseshoe-sharpener.....J. D. Leclerc  
Horseshoe. Soft-tread.....J. Riley  
Hose-coupling.....E. T. Shaw  
Hose-nozzle. Combination.....W. Mathen  
Hot-air register.....H. Symonds  
Index. Card.....F. Macey  
Indicating-tablet.....E. H. Stone  
Inking-pad.....T. Roberts  
Insect-escape and ventilator for window-sashes.....M. Friedly  
Insect-screen.....G. Sattler  
Ironing-machine.....C. Riesenweber  
Knit goods. Finishing.....J. May

Knitting-machine stop-motion. Circular.....W. J. Ferris  
Ladder. Extension.....G. W. Gardner  
Lamp. Vapor.....W. A. B. Dalzell  
Lamp. Vapor.....W. H. Irby  
Latch for swinging bins.....C. A. Babb  
Loading operations. Checking up.....M. J. Dooley et al  
Locomotive sanding device.....H. H. Huff  
Logging-truck.....J. Lindsey  
Loom.....I. W. Chandler  
Loom.....J. Corzilius  
Loom filling changing mechanism.....E. S. Stimpson  
Loom picker stop mechanism.....D. Young  
Looms. Electrical warp stop-motion for.....J. Coldwell et al  
Looms for weaving double-pile fabrics. Indicating device for.....J. Corzilius  
Lubricator.....G. B. Essex  
Lubricator.....J. Power  
Magnesium sulfate from brine. Obtaining.....G. N. Vis  
Mail-bag catcher. Railway.....J. Kaiser  
Mail-matter-marking machine.....F. G. Jahn  
Measure. Tailor's.....G. Frega  
Measuring instrument. Electric.....J. Harris  
Meat-powder. Making.....H. J. Dunn  
Mechanical motor.....W. W. Teague  
Metallic sulfids. Enriching.....H. Petersen  
Metals from ores by electricity. Separating.....G. D. Burton  
Milk. Automatic apparatus for weighing and delivering.....A. B. Wright  
Mine trap-door.....A. Hurford  
Mining-machine.....H. J. Haley  
Mirrors. Absorbing surplus mercury in the manufacture of.....D. J. Murnane  
Miter-box.....A. Vick  
Mold.....W. F. Giles  
Mower.....J. F. Wells  
Mud-guard.....T. J. Ward  
Music-leaf turner.....E. W. Eaton  
Music-leaf turner.....F. Schaffter  
Musical instrument. Self-playing.....J. W. Whitlock  
Nail heading device.....A. H. Brigham  
Necktie-support.....D. E. Lantz  
Neckwear-retainer.....W. O. Horn  
Nest. Hen's.....F. C. Meagher  
Nitrogen compounds. M'f'g.....2 pats.  
Nut-lock.....C. B. Jacobs  
Nut-lock.....R. Laurin  
Onion-pulling machine.....R. H. Smith  
Optometer.....A. J. Cross  
Ordnance-sight.....L. K. Scott  
Oven. Baking.....G. R. Moon  
Package for medicines.....L. E. Moore  
Pail cover. Sap.....2 pats.  
Paper-board forming device.....2 pats.  
Paper-making machines. Apparatus for cleaning wire webs in.....J. M. Shepherd  
Paper-making machines. Wire-web guide for.....T. Harvey, Jr  
Parquetry.....C. E. Rider  
Peat. Machine for treating.....A. Rom  
Peat. Machine for treating.....J. Ahrens  
Pen. Fountain.....J. A. Perry  
Photographer's exposure-scale.....R. J. Hagey  
Photographs. Coloring.....P. M. C. Grenier-Villerd  
Pictures. Displaying living.....R. Fulgora  
Pile-driving-machine pile-holder.....J. G. Falcon  
Pipe cap and plug. Combined.....J. A. Bernardi  
Pipes. Locating concealed water.....F. T. Iddings et al  
Pistol. Magazine.....O. A. Hoffmann  
Plane. Miter.....C. B. McCallum  
Planing-machine. Radial.....C. C. Newton et al  
Plow. Double-shovel.....J. W. Gooding  
Plow. Wheel.....D. A. Houser  
Pneumatic-dispatch system.....2 pats.  
Post or pole base.....C. S. Davier et al  
Pressure-transmitter.....C. L. Barrett  
Printing-machine.....L. L. Prescott  
Printing-machine.....J. L. Firm  
Printing-machines. Sheet feeding attachment for stencil.....A. B. Dick  
Propelling and steering device for ships. Pneumatic.....C. Janczarski  
Pruning implement.....C. Tiffany  
Pump. Double-acting.....J. M. Stukes et al  
Puzzle.....C. A. Smith  
Rails. Manufacture of.....J. S. Seaman  
Railway-crossing gate.....C. R. Woodward  
Railway switch.....A. A. Strom  
Railway system. Electric.....W. Robinson  
Railway-tie. Metallic.....S. F. Swanson  
Reaping-machine stalk-raising device.....E. Ullmann  
Reed. Universal warping.....H. C. Dreyer  
Refrigerator.....2 pats.  
Rein-holder.....J. C. Tolliver et al  
Rein-holder.....A. H. Taylor et al  
Rock-drill head.....W. A. Dudley  
Rod-jack.....J. S. McCarriston  
Rotary engine.....C. F. Moss et al  
Rubber-dam clamp.....J. W. Ivory  
Sample-bag.....J. S. Herriott  
Saw-frame.....A. Demers  
Saw. Grooving.....J. M. Garrison  
Saw. Grooving.....G. R. L. Stimers  
Saw mill. Band.....E. E. Thomas  
Sawmill-carriage offset mechanism.....L. J. Hanhart  
Saw-set.....D. C. Wiest  
Screw-coupling.....3 pats.  
Screw-on-stopper.....J. W. Dixon  
Secondary battery.....V. Cheval et al  
Separator.....W. F. Williams  
Sewing-machine clamp mechanism. Button.....F. T. Leilich  
Sewing-machine. Overseaming.....H. H. Fefel  
Shade fixture. Window.....J. W. Forbes  
Shade-roller.....E. F. Meagher  
Shaft-coupling disconnecting-gear.....C. Van Gyn  
Shearing machine. Animal.....C. M. Palmer  
Sheet metal. Apparatus for perforating designs in.....N. B. Evans  
Sheet-metal-bending machine.....F. Thoulas  
Shell.....H. Bickel  
Shirt. Apparel.....S. A. Israel  
Shoulder-brace.....L. S. Long  
Shutter-protector.....M. E. Woodworth

Sifter. Ash.....E. Kinze  
Signal.....J. M. Sailer  
Skate.....E. H. Hould  
Slats to canvases. Device for attaching.....J. MacPhail  
Slip-socket.....H. R. Hardenburg  
Snow-compressor.....W. Westlake  
Solar heater.....H. Tudor  
Soldering machine. Can.....E. P. Hadden  
Sower. Broadcast seed.....B. F. Howard  
Spinning and twisting frame.....A. Mason  
Spool-stand.....I. C. Lincoln  
Square. Adjustable framing.....S. J. Hester  
Stacker. Straw.....P. Roger  
Stacker. Straw.....H. Ries  
Starch-treating apparatus.....C. B. Duryea  
Steam-boiler.....2 pats.  
Steam-boiler.....J. A. Cain  
Steam-boiler.....E. N. Janson  
Steam-boiler.....L. Sedzwick  
Steam-boiler.....W. M. Thompson et al  
Steam-cylinders. Expansion compensating device for.....E. Koniz  
Steam-engine.....3 pats.  
Steam-generator.....G. F. G. Des Vignes et al  
Steam-generator.....R. Fiedler  
Steam-generator separator.....J. I. Thornycroft  
Steam-motor.....M. Jonsson  
Stocking supporter.....L. A. Crockett  
Stovepipe.....C. A. Smith  
Stripping-machine attachment.....W. F. McAllister  
Studing-box.....C. C. Carroy  
Tables. Rotatable center for dining.....G. H. Schroeter  
Tag-making machine.....G. W. Swift, Jr  
Tanning and dyeing process.....P. W. Wartenberger  
Teaching device. Music.....L. McLaren  
Telephone-relay.....W. G. Crumson  
Therapeutic device.....A. W. Steiger  
Thread-cutter.....O. H. Boltz  
Throttle.....H. Schutze  
Tide-motor.....F. R. Kinball  
Tin. Making phosphor.....G. Berthold  
Tin-plate machinery. Hoisting device for.....J. F. Fawcett  
Tobacco-cutting process.....C. E. Smith  
Tobacco-cutting machine.....N. Du Bnd  
Tobacco-pipes. Smoke-cooler and nicotine-extractor for.....W. B. Hughes et al  
Tooth. Artificial.....C. S. Talbert  
Toy.....S. W. Kaplan  
Toy. Mobile.....M. J. Steffens  
Toy piano.....A. Schoenhut  
Trace-carrier.....P. A. Prudhomme  
Train-indicator.....W. M. Six et al  
Trains. Preventing derailling of.....L. A. Grinda y Gniol  
Trolley.....W. A. Daggert  
Tube-cutter.....H. A. Benedel  
Tubular casings. Machine for filling.....C. Imboden  
Tune-sheet feeder.....2 pats.  
Turning. Tool for.....E. A. Havens  
Tying machine. Parcel.....J. C. Collins  
Type-writing machine.....E. E. Barney  
Type-writing machine.....2 pats.  
Type-writing machine.....J. Felbel  
Type-writing machine.....H. W. Merritt  
Umbrella and billiard-cue grip.....M. Mendel  
Universal joint.....F. E. Bocrorski  
Universal joint.....J. J. Jetter  
Valve. Gas-engine.....A. A. Lazier  
Valve-gear spring tension device.....L. G. Wulbern  
Vehicle-frame.....A. Bath  
Vehicle. Motor.....C. J. Coleman  
Vehicle. Motor.....H. J. Lawson  
Vehicle. Motor.....C. T. Shonp  
Vehicle running-gear.....G. M. Wood  
Vehicle. Spring.....A. Schubert  
Vehicle wheel. Motor.....C. G. Ensign  
Vehicles. Automatic speed governor for electric.....H. F. Parshall  
Velocipede wheel-rim.....E. W. McCaslin  
Veneers. Manufacturing articles from.....C. Wirtkowsky  
Ventilator.....T. C. Avery  
Vessel for passengers.....A. W. Bibby  
Vote register.....H. A. Clifford  
Voting machine.....C. Christensen  
Wagon-reach clamp.....W. H. Weber  
Wagon tail-gate.....J. M. Lillpop  
Wagon-unloader.....W. Barclay  
Washing-machine journal-box.....D. K. Tullis  
Water-closet.....P. J. Madden  
Water-closet bowl.....C. Schifflin  
Water-tank.....M. Shapiro  
Water-tube boiler.....J. F. Casey et al  
Water-wheel.....J. W. Taylor  
Waterer. Stock.....G. S. Randle  
Well-boring apparatus.....A. and A. Panek, Jr  
Wells. &c. Treating deep.....W. Mooney  
Wheel.....P. C. Campbell  
Wheel.....B. J. Diplock  
Winding cops.....2 pats.  
Windmill.....J. H. Rickman  
Windmill.....E. Steude  
Windmill.....O. J. Ziegler  
Window-ventilator.....C. O. Meurk  
Wire cable. Manufacturing.....E. I. Parsons  
Wire-splicing machine.....H. Jacobs  
Wire-stretcher.....H. Jacobs  
Wire-stretcher.....R. Thomson, Jr  
Wood-filling compound.....E. A. Meyer  
Woodworking-machine brush attachment.....H. Marles  
Wool-drying apparatus.....T. Ender et al  
Work-support.....J. Robinson et al  
Woven fabric.....2 pats.  
Woven fabric.....2 pats.  
Woven fabric.....2 pats.  
X-ray apparatus. Coin-controlled.....F. Nengebauer  
Yoke. Neck.....J. H. Youngen

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Acetylene-generator.....J. A. Mosher  
Acid. Making pure carbonic.....3 pats.  
Advertising apparatus.....H. S. Elworthy  
Advertising device. Street-car.....J. A. Kennedy-McGregor  
Advertising-scale.....J. N. Johnson  
Agricultural machine. Automobile.....W. F. Crowley  
Alkalis. Making.....2 pats.  
Axle.....W. C. Dalzell  
Axle. Car.....J. S. Hickey et al



Band-cutter and feeder.....W. W. Collins  
 Band-cutter and feeder.....W. C. Peterson  
 Barrel-heading self-fastener and holder  
 combined. Veneer.....M. Ferguson  
 Barrel-opener.....J. A. Beronio  
 Basin. Sanitary receiving.....B. R. Guion  
 Bed-bottom.....G. H. McBride  
 Bedsteads. Casting metallic.....  
 .....G. H. Williams  
 Bell.....A. B. Hinn  
 Bicycle.....F. J. Stallings  
 Bicycle. Interlocking.....O. I. Straub  
 Bicycle speed mechanism.....J. A. Cardinell  
 Bleaching process.....J. Pullman et al  
 Boiler-tube.....J. Niclausse et al  
 Bolting-machines. Cloth-cleaning device  
 for sieves in.....J. C. Maun  
 Bookbinding.....J. L. Bailey  
 Bottle. Non-refilling.....J. H. Doerr  
 Bottle-stopper.....2 pats.....P. Lindemeyer  
 Bottom bracket.....G. Egger  
 Box-lifter.....G. Nevenzel  
 Bracket or fixture.....E. S. Lord  
 Bridle-bit.....J. L. Lee  
 Broom-corn cleaner.....P. Lamboy  
 Broom-holder.....H. Blome  
 Brush. Polishing.....F. W. Yale  
 Burner.....M. Cahill  
 Burning liquid fuel.....J. Boyle  
 Bustle.....H. H. Taylor  
 Butter. Chilling.....W. Helm  
 Button.....H. Hirschbach  
 Button. Collar.....L. C. Witkowski  
 Calendar-holder.....2 pats.....W. S. Russell  
 Cap for closing vessels.....2 pats.....A. A. Low  
 Car-coupling.....E. Hien  
 Car doors. Weather-guard for freight.....  
 .....J. M. Hopkins  
 Car. Electric.....A. A. Ingraham  
 Car-fender.....J. L. Conner  
 Car. Platform.....E. C. Huse  
 Carbon rod for electric lamps.....H. Bremer  
 Cardboard. Apparatus for cutting ovals  
 from.....2 pats.....W. H. Forker  
 Card-holder.....W. S. Congdon  
 Card-lock rod.....D. E. Hunter  
 Carriage corner-iron.....E. C. Porter  
 Carving-machine.....E. Lochman  
 Case or cabinet.....J. R. Burton  
 Cash-register.....A. Frederiksen  
 Casting plant.....M. M. Sappes  
 Chains. Manufacture of.....A. Mason  
 Checking device.....C. J. Castera, Jr  
 Chemical apparatus.....P. Naef  
 Chest. Tool.....M. Beaudin  
 Chuck.....W. D. F. Smith et al  
 Churn.....F. H. Boggess, Sr  
 Chute. Coal delivery.....S. W. Taylor  
 Cigar-box.....W. M. Williams  
 Cloth-cutter.....C. F. Sparks  
 Cloth of changeable color. Merchandise  
 printed.....C. H. Hope  
 Clutch and brake.....A. E. Mathey  
 Coal-digger.....W. T. Ginn  
 Coal handling and crushing apparatus.....  
 .....M. M. Sappes  
 Compartment-box.....W. F. Coston  
 Conveyor dumping mechanism.....  
 .....A. L. Le Grand  
 Conveyor loading mechanism.....  
 .....A. L. Le Grand  
 Corner strip or head.....2 pats.....F. A. Mitchell  
 Crank-hanger.....J. E. Roberts  
 Crate-fastening.....S. W. Damon  
 Crayon-making machine.....  
 .....J. C. Scheuffer et al  
 Cream-ripening apparatus.....J. Eicher et al  
 Cream-separator.....F. W. Moseley  
 Crumppanionum solutions. Making.....  
 .....M. Fremery et al  
 Cycle crank mechanism.....P. H. Brennan  
 Cycle-frame joint.....J. R. Trigwell  
 Digester.....E. G. Murphy  
 Display device. Panoramic.....C. L. Fowler  
 Display-tray.....N. E. Levy et al  
 Door. Automatic.....J. H. Whitaker  
 Door-check.....D. Schuyler  
 Door check and closer.....2 pats.....  
 .....W. H. Taylor  
 Door closer and check.....D. Morgau  
 Door. Sliding.....P. L. Sheridan  
 Door-stop.....F. L. Rosentreter  
 Dough into loaves. Molding.....J. Callow  
 Draft-equalizer.....J. W. Miller  
 Draft-equalizer.....J. F. Smith  
 Drilling-machine.....A. E. Jordan et al  
 Driving mechanism.....C. D. P. Gibson  
 Dye and making. Anthracene.....R. E. Schmidt  
 Dye and making. Blue chrysazin.....  
 .....R. E. Schmidt  
 Dye and making. Blue diphenyl-naphthyl-  
 methane.....O. Nastvogel  
 Dye and making. Brown.....P. Ott et al  
 Dye and making. Brown azo.....P. Ott et al  
 Dye and making. Green-yellow.....P. Scholl  
 Dynamo-brush.....C. Endrweit  
 Dynamo regulation.....I. E. Storey  
 Earth-drill. Horizontal.....H. E. Williams  
 Educational top.....W. R. Ellis  
 Electric furnace.....C. S. Bradley  
 Electric meter. Coin-setting.....F. Kraemer  
 Electrodes for primary batteries. Oxidiz-  
 ing negative.....C. J. Coleman  
 Elevator.....W. F. Leonard  
 Elevator.....G. H. Reynolds  
 Embossing-machine.....G. P. O'Connor  
 Engine cylinders. Apparatus for indicating  
 effective pressures.....W. Ripper  
 Engines. Blocking traction.....G. F. Conner  
 Envelop.....G. P. Homeier  
 Exhibiting boots or shoes.....M. A. Kennedy  
 Explosive-engine.....E. Haynes et al  
 Fabrics. Raising nap on.....  
 .....W. H. Baker et al  
 Farm-gate.....J. E. Moore  
 Fanelet. Measuring.....W. McCausland  
 Feed-water heater.....J. F. Deems  
 Feeder. Automatic gravity boiler.....  
 .....H. C. Needham  
 Fence tightener. Wire.....S. Northrup  
 Fence tool. Wire.....O. L. Brown  
 Fence. Wire.....R. H. Bloomer  
 Fifth-wheel.....W. S. Frazier, Jr  
 File for papers.....A. M. Kolderup  
 Filter.....W. B. Lindsay et al  
 Firearm-sight.....S. E. Fischer  
 Fire-escape.....J. M. Swift  
 Fire-hose.....M. Relling  
 Fire-pot lining.....J. F. Hollings  
 Flues. Means for cleaning furnace.....  
 .....W. T. Van Doru

Flour-bolter.....E. T. Butler  
 Flume. Knockdown.....A. L. Adams  
 Flushing apparatus.....H. C. Montgomery  
 Folding-machine.....G. F. Pfeiffer  
 Friction-wheel.....C. W. Hunt  
 Fuel. Preparing.....W. M. Gillam  
 Furnace for burning refuse material.....  
 .....J. F. Lester et al  
 Garment-support.....L. W. Ballard  
 Gas-engine.....C. W. Sharple et al  
 Gas generator. Acetylene.....I. L. Harris  
 Same.....E. M. Rodenberger et al  
 Same.....P. Wiens  
 Gas-manufacturing apparatus.....H. Riche  
 Gas-meter.....A. Henning  
 Gas-producer.....G. W. Shem  
 Gas-strainer.....J. A. Mosher et al  
 Gasket or packing.....Reissne  
 Gear. Variable-speed.....C. H. Merwarth  
 Gear-wheel transmission.....E. Lang  
 Gear-wheel transmission.....E. von Trautvetter  
 Glass-finishing machine.....C. Z. F. Rott  
 Graphophone-point.....J. W. Moyer  
 Grinding-machine.....J. H. McElroy  
 Grinding machine. Tool.....J. H. Burek  
 Gun mounting. Turret.....A. T. Dawson et al  
 Gun-sight. Quick-adjusting.....S. E. Fischer  
 Gutter-hanger.....J. M. Laird  
 Flame-fastener.....D. Little  
 Flame-strap.....W. F. Amend  
 Hammer. Pneumatic.....E. A. Fordyce  
 Harvester. Corn.....J. Wagner  
 Hay-rake.....J. H. Hughes  
 Heat and electricity to the body. Ap-  
 plication for imparting.....I. Timar  
 Heater. Combination hot-air and steam or  
 hot-water.....A. E. Gay  
 Hinge for furniture. Friction.....C. L. Frost  
 Hog holding rack.....J. W. Hardy  
 Hose and skirt supporter and shoulder-  
 brace. Combined.....M. F. Loving  
 Hose-coupling.....R. Williams  
 Indicating device.....C. D. Weaver  
 Insect-trap.....W. H. H. Lundy  
 Insufflator.....H. H. Groth  
 Internal-combustion motor.....W. E. Simpson  
 Ionone derivative and making same.....  
 .....J. C. W. F. Tienanu  
 Iron into steel. Converting.....E. Hardmeyer  
 Journal-bearing.....G. A. Scheffer  
 Knitting machine attachment. Automatic  
 circular.....A. G. Wright  
 Ladder safety-hook. Fireman's.....  
 .....C. N. Richardson et al  
 Ladder. Step.....C. Pfeiffer  
 Lamp support. Miner's.....C. J. Heckel  
 Lamps, &c. Extinguisher for.....W. E. Archer  
 Latch. Gate.....W. J. Schoonover  
 Lathing and fireproof construction for  
 buildings. Metallic.....M. Carrick  
 Letter-sheet.....S. Clawson  
 Linotype-machine.....O. Mergenthaler  
 Liquids, &c. Means for detecting falsifica-  
 tion of.....A. Braly et al  
 Liquids. Crystallizing solids from.....  
 .....2 pats.....P. Naef  
 Liquids with gases. Apparatus for treat-  
 ing.....2 pats.....P. Naef  
 Lock.....H. L. Kellogg  
 Lock.....E. R. Pickard  
 Lock.....D. W. Tower  
 Lock and burglar-alarm.....S. Ritchie  
 Locking device. Door.....I. F. Redfelsen  
 Loom warp-thread guide.....N. Cartier  
 Lubricating apparatus. Axle.....F. Surth  
 Lubricator.....W. E. Simpson  
 Luggage-carrier.....J. Dembinski  
 Mail-bag.....S. P. Steele  
 Mail delivery.....B. Hull  
 Mailing attachment. Book.....  
 .....W. F. Mahony  
 Margarin. Product for making.....M. Poppe  
 Massage apparatus.....O. C. A. Carlsson  
 Match-box.....H. C. Paul  
 Mechanical movement.....W. A. Pitt  
 Mechanical movement.....H. D. Williams et al  
 Metal. Transporting molten.....S. R. Perry  
 Microscope.....E. Bausch  
 Moistening, closing, and applying stamps  
 to envelops. Machine for.....W. S. Post  
 Mortar-mixing machine.....W. L. Hayes  
 Movements. Mechanism for imparting suc-  
 cessive or alternating.....E. Moore  
 Nail assorting and bunching tool.....  
 .....M. J. Whalen  
 Needle for weaving cane fabrics.....G. O. Redpath  
 Nozzle deflector. Hydraulic.....J. W. Smith  
 Nozzle-holder.....S. G. Mills  
 Nut. Wear-adjusting.....W. H. Holliday  
 Nut-lock.....J. D. Dowell et al  
 Nut-lock. Vehicle-wheel.....E. W. Reed  
 Nut. Rotary.....F. W. Buhne et al  
 Nut. Vehicle-axle.....G. W. Terry  
 Nut wrench. Axle.....J. Deebie  
 Ore crusher and amalgamator.....L. Jacques  
 Ore-treating.....2 pats.....G. M. Westman  
 Ornamenting surfaces.....J. T. Cormack  
 Painting machine. Molding.....R. F. Cermak  
 Paper box.....F. J. Schleicher  
 Paper-feeding machine.....T. C. Dexter  
 Pot-sheller.....L. A. Aspinwall  
 Phonograph.....Reissne  
 Piano-action.....E. M. Hamilton  
 Piano-forte.....K. Binder  
 Picture-back boards. Making.....  
 .....L. A. Denther  
 Picture-frame.....H. Davidson  
 Pin-shafts with heads of glass. Simultane-  
 ously providing.....R. Neuss  
 Planter marker-bars. Lifter for corn.....  
 .....A. E. Newman et al  
 Planter. Potato.....L. A. Aspinwall  
 Planter. Seed.....W. F. Crowley  
 Planter. Seed.....H. C. Kettler  
 Planter. Sugar-beet-seed.....F. B. Hassenstab  
 Plaster. Wall.....T. A. Robinson  
 Plow. Riding.....W. A. Baldwin et al  
 Plow and cultivator.....2 pats.....B. P. Nubar  
 Pole or post base.....L. K. Forsythe  
 Press.....H. E. Pridmore  
 Pressure-regulator.....J. A. Mosher et al  
 Printing-press punch. Platen.....A. W. Knox  
 Projecting apparatus.....F. J. Adams  
 Propeller. Boat.....C. T. Rosebrough  
 Propelling railway-velocipedes, boats, &c.  
 Mechanism for.....G. Tjerneld  
 Propulsion. Boat.....H. H. Fefel  
 Prudding-furnace.....S. P. Kettering  
 Pulley. Clutch.....B. Abel

Pulverizer.....C. H. Duisdieker  
 Pulverizer. Soil.....J. D. Perry  
 Pump. Rotary.....H. A. Hancock et al  
 Puncting-bag support.....G. McFadden  
 Purse. Money.....J. J. Peters  
 Quilting-frame.....L. A. Wolfe  
 Radiator-valve.....2 pats.....J. T. Kelly  
 Radiators. Automatic air-valve for.....  
 .....F. A. Headson  
 Rail-joint.....T. C. Du Pont  
 Rail joint or chair.....E. Lane  
 Railway block system.....B. C. Rowell  
 Railway bond-tie. Electric.....  
 .....W. A. Downing et al  
 Railway cattle-guard.....J. Donovan  
 Railway-crossing signal.....M. W. Taylor  
 Railway. Electric.....E. M. Bentley  
 Railway-joint. Portable.....A. H. Alloud  
 Railway-track structure.....2 pats.....  
 .....T. C. Du Pont  
 Railway-track structure.....E. B. Entwistle  
 Railway-track structure.....C. F. Kress, Jr.  
 Railway-track structure.....P. G. Stormer  
 Razor-stropping device.....2 pats.....  
 .....F. Kampfe et al  
 Razor-stropping machine.....W. W. Patrick  
 Receptacle-closure.....J. S. Clark  
 Receptacle-closure.....H. S. Reynolds et al  
 Refuse-destructor and steam-generator.  
 Combined.....J. T. Wood et al  
 Respiratory mask.....D. W. Schaeffer  
 Ring-stamping apparatus.....W. H. Ford  
 Rivet-head-cutting tool.....T. Brown  
 Rocking device.....K. Geier  
 Rolling-mill spring appliance.....L. Morgan  
 Rotary engine.....H. A. Hancock et al  
 Rotary engine or motor.....W. A. Pitt  
 Rotary motor.....R. F. Marsh  
 Rubber heel.....W. E. Herbst  
 Sate.....J. T. Hough  
 Sand-press.....W. M. Potter  
 Sausage-cleaning machine.....  
 .....G. W. Constantine  
 Sausage making machine.....H. C. Atkinson  
 Scale.....W. F. Stimpson  
 Scale. Computing.....L. P. Halladay  
 Scale. Price.....C. F. Christopher  
 Screw-cutting machine.....E. Phillips  
 Seal-lock.....H. M. Grover  
 Seal-lock.....J. D. C. Knapp  
 Scaling-cap. Vessel.....A. A. Low  
 Secondary battery.....2 pats.....C. J. Coleman  
 Sewage-purifying apparatus.....E. R. Guoin  
 Sewer-trap.....T. F. Byrnes  
 Sewing machine. Buttonhole.....W. N. Parkes  
 Sewing-machine for making fringe.....  
 .....G. Rehfuess et al  
 Sewing machine. Shoe.....G. E. Warren  
 Sewing-machine tuck creaser.....L. Rueweler  
 Sharpener. Knife.....J. H. Agesen  
 Single-gage.....C. Wilson  
 Shirt. Apparel.....J. Richardson  
 Shoe.....E. H. Christensen  
 Shoe-polishing stand.....J. F. Gilliland  
 Sign. Illuminated.....E. G. Stephens  
 Sign and show-case. Duplex.....I. Emmer  
 Skirt-supporter and shirt-waist holder.....  
 .....W. Lamb  
 Sliding gate.....J. W. Baker  
 Smoke-consuming apparatus.....H. L. Fleming  
 Smoke-consuming furnace.....J. A. Crawford  
 Soldering-iron. Self-heating.....H. A. Ross  
 Spectacle-attacher.....A. M. Felson  
 Spectacle hinge-joints. Blank for.....  
 .....F. A. Stevens et al  
 Speculum.....J. W. Morrow  
 Spike-making machine.....J. Gribben  
 Spinning-spindle.....C. E. Smith  
 Stamping-machine.....C. M. Pierce  
 Stave-dressing machine.....A. Dunbar  
 Steam-boiler.....A. Blechynden  
 Stool for lunch-wagons. Window.....  
 .....T. H. Buckley  
 Stove. Continuous-combustion.....F. C. Bormann  
 Stove. Electric.....H. J. Dowsing  
 Stove. Gas.....E. W. Sibbett  
 Strainer.....J. J. Murphy  
 Straps to knapsacks. Securing.....  
 .....R. Dunkelberg et al  
 Striking-bag frame.....G. McFadden  
 Sugar-juice defecator.....L. von Tresckow  
 Table and folding bed. Combined.....  
 .....J. H. Reford  
 Teaching children to walk. Apparatus for.....  
 .....E. Reifli  
 Telephone-directory.....W. J. Bell  
 Thermostat.....W. E. Mack  
 Thill-coupling.....O. H. Platt  
 Threshing-machine attachment.....  
 .....E. G. Howard  
 Threshing-machine feeder.....T. E. Mahoney  
 Tile-perforating device.....I. Stripe  
 Tire remover. Wheel.....B. M. Buckland  
 Tire-supporting frame.....G. L. Clark  
 Tire. Vehicle.....R. E. Olds  
 Tires. Device for equipping vehicle-wheels  
 with rubber.....2 pats.....A. W. Grant  
 Tongs for cleaning drains.....J. E. Patton  
 Top-spinner.....A. W. Morgan  
 Towel or paper rack.....E. C. Alford  
 Trace-carrier.....W. F. Smith  
 Track-sanding device.....J. H. Watters  
 Trolley.....A. Piton  
 Trolley-wheel.....D. F. L. Jones  
 Trousers-hanger.....M. A. Gilman  
 Trouser-hanger.....H. C. Hopkins  
 Truck. Car.....2 pats.....H. R. Keithley  
 Truck. Car.....J. L. Levy  
 Truck. Car.....E. G. Neweener  
 Truss. Hernal.....J. C. Keil  
 Truss-pad-adjusting device.....A. B. C. Sawyer  
 Tunneling-shield.....C. G. Hastings  
 Twisting-machine.....G. P. Schlemmer et al  
 Type-writer.....W. S. Craig  
 Type-writing machine.....C. G. Sholes  
 Universal joint.....P. Cunningham  
 Valve-gear. Reversing.....C. Weller et al  
 Valve. Reversing.....D. J. Hoisington et al  
 Vanillin derivatives. Obtaining.....  
 .....A. C. Jensen  
 Vault. Bank.....J. T. Hough  
 Vehicle-brake.....M. Vidie  
 Vehicle apparatus. Motor.....  
 .....L. S. Clarke et al  
 Vehicle mud-guard.....D. Hitchcock  
 Vehicle-wheel.....J. N. Byers  
 Vending-machine. Coin-controlled.....  
 .....D. K. Stone

Velocipede-brake.....H. A. Lamplugh  
 Ventilating apparatus.....J. J. Donovan  
 Vise.....V. J. McDonnell  
 Vulcanizer.....F. A. Seiberling  
 Vulcanizing-press.....F. A. Seiberling et al  
 Wagon. Dumping.....C. S. Pharis  
 Wagon or truck gear.....G. T. Willis  
 Warp-stop-motion mechanism.....W. E. Allen  
 Washing-machine mechanism.....J. A. Grove  
 Water-closet.....C. W. Franzheim  
 Water-closet attachment.....N. Stow  
 Waterproofing coating.....S. Hansel et al  
 Welding-machine. Electric.....O. Parpart  
 Wheel-render and emergency-brake. Com-  
 bined.....E. L. Regnard et al  
 Wheel rim. Vehicle.....A. W. Kent  
 Wheelbarrow.....J. B. Willsea  
 Winch. Crab.....W. T. Eades et al  
 Wind-wheel regulator.....H. Renter  
 Windmill.....J. H. Stoll  
 Windmill-regulator.....C. H. Rohlf  
 Windmill-regulator.....A. T. Scott  
 Window-fastener.....A. E. Appleton  
 Wire-stretcher.....J. M. Knbart  
 Wire-tightener.....S. T. Beal  
 Wood. Charring-tool for ornamenting.....  
 .....J. Schlegel  
 Woodworking-machine.....J. M. Nash  
 Wrench.....F. A. Chellis  
 Wrench.....C. D. Scott et al

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Advertiser. Railway.....L. H. Simmons  
 Advertising motor-vehicle.....A. F. Randall  
 Annunciator. Thermo.....J. C. J. Stepanau  
 Aquatic course.....H. N. Ridgway  
 Auger-cutter.....W. T. Kellogg  
 Automobile.....O. V. Lachelle  
 Automobile appliance.....E. W. Ayres  
 Automobile motor-wheel.....H. Simmons  
 Automobile steam-motor.....F. W. Waterman  
 Bag fastener. Traveling.....B. F. Du Bois  
 Bag-holder.....C. M. Hirsch  
 Bake-furnace.....W. J. Meikleham  
 Bale-band tightener.....F. Speltstosser  
 Baling-press.....F. L. White  
 Battery fluid.....G. Romanelli  
 Battery-jar cover.....P. P. Nungesser  
 Bed.....I. C. Burgett  
 Bed.....N. Clement  
 Bed-pad.....I. W. Legg  
 Bell mechanism. Bicycle.....P. A. McCaskey  
 Belt. Apparel.....2 pats.....G. H. Gentzel  
 Belt for ore-concentrators.....W. J. Loring  
 Bending-machine.....O. J. Beaudett  
 Bicycle fork crown.....H. L. F. Trebert  
 Bicycle-frame pump.....C. A. Romans  
 Bicycle propelling device.....J. C. Devlin  
 Bicycles. Saddle for.....T. I. Duffy  
 Binder. Temporary.....A. Buckler  
 Blanket.....T. D. Gordon  
 Boot or shoe stretcher.....E. J. Leighton  
 Boot-tree.....H. B. Pelton  
 Bottle. Non-refillable.....W. Hinton  
 Bottle. Non-refillable.....F. J. Stallings  
 Bottle-stopper and sprinkler.....W. W. Lowrey  
 Bottle-washer.....M. E. Donally  
 Box-making machine.....H. E. Henschel  
 Brake-beam.....F. B. Aglar  
 Brake-shoe.....T. W. Mitchell  
 Brush-cabinet. Painter's.....J. H. Francis  
 Buckle and trace-carrier. Back-band.....  
 .....M. Taylor  
 Buseu burner.....F. M. Brooks  
 Button-blank-cutting machine.....N. Barry, Jr.  
 Button-drilling machine.....N. Barry, Jr.  
 Button-grinding machine.....N. Barry, Jr.  
 Cabinet.....J. L. Tandy  
 Camera clamping socket.....G. W. Hall  
 Camera focusing attachment.....J. Gaut  
 Camera focusing device.....J. A. Mosher  
 Camera focusing device.....H. E. S. Singleton  
 Camera. Magazine.....G. de Goefroy  
 Can cooler. Milk.....R. B. King  
 Candelabrum.....G. P. Kato, Jr.  
 Car body transom. Railway.....2 pats.....  
 .....G. I. King  
 Car chock. Railway.....J. T. Condon  
 Car construction.....G. I. King  
 Car. Dumping.....T. Hill  
 Car-dumping apparatus.....J. W. Castleman  
 Car-fender.....H. Lutzenkirchen  
 Car. Gondola.....G. I. King  
 Car-roof.....J. Hodge  
 Car-seat.....2 pats.....P. M. Klug  
 Car-seat. Step-over.....C. K. Pickles  
 Car sign. Street or other.....L. J. Cooper  
 Cars. Mechanism for supplying electric  
 power to railway.....G. F. Gale  
 Cars. Phonographic annunciator for.....  
 .....A. C. Wolfe  
 Cars, &c. Protecting apparatus for tram-  
 way.....A. Thiels  
 Carbon from tar. Separating free.....  
 .....F. Lennard  
 Carbonating apparatus.....E. E. Murphy  
 Card wire. Jacquard.....R. L. Shaw  
 Carding-machine feed mechanism.....  
 .....J. B. Platt  
 Carpenter's gage.....G. H. Thompson  
 Carpet-sweeper balls. Device for attaching  
 handles to.....F. C. Mason  
 Carriage-motors. Supporting-frame for.....  
 .....C. A. Lindstrom  
 Cash-register.....L. Ehrlich  
 Cell-case machine.....J. Starman  
 Cell-case machine.....W. E. Williams  
 Channels of streams. Improving and pre-  
 serving.....M. W. Bell  
 Check-rower wire. Making.....J. W. Parker  
 Checking collectors in public conveyances.  
 Means for.....J. F. Ohmer  
 Churn.....J. H. McCausland  
 Circuit device.....P. M. Lincoln  
 Clip-forming machine.....G. E. Soper  
 Cloth-cutting apparatus.....M. A. Adler  
 Clothes-pin.....C. R. Towers  
 Coal or rock drill.....J. Eagen  
 Coat-holder.....A. L. Platt  
 Cock with closing device. Cut-off.....  
 .....H. Moeres  
 Coin-controlled mechanism for dispensing  
 newspapers.....G. Easterbee  
 Coin-delivery machine.....E. J. Brandt  
 Coking-oven.....C. G. Atwater  
 Combustion process.....C. Hornbostel  
 Condenser cooling attachment.....  
 .....C. F. Conover



Cooking and steaming meats, vegetables, &c. Apparatus for.....L. N. Donbler  
Cooking utensil.....W. H. Golding  
Cooling and condensing machine.....H. D. Pownall  
Corset. Apparel.....M. L. Bareley  
Corset-clasp.....J. G. Dallaire  
Cotton chopper and cultivator.....N. S. McCracken  
Cotton-picker's shade.....A. Voorhies  
Cotton-valve.....G. W. Williams  
Coverlock. Vessel.....L. A. Frank  
Cover. Self-closing aperture.....M. W. Sewall  
Crate. Folding shipping.....A. Braun et al  
Cream-separator.....E. H. Pifer et al  
Current-motor.....G. Walter  
Curtain-support.....E. Damran  
Cuspidor.....C. J. Merritt  
Cut-off and governor.....F. W. Bohn  
Cycle saddle-supporting device.....D. S. Fraser  
Dentistry.....A. P. Johnson  
Derrick. Lever.....J. W. Benton  
Dining-room serving apparatus.....J. Doyle  
Display-rack.....J. H. Best  
Distilling apparatus. Wood.....C. W. Biffinger  
Door-check.....E. E. Jones  
Door-check. Liquid.....H. K. Jones  
Door or window ventilator.....P. Abrahamson  
Door-securer.....F. D. McGee  
Door-stop.....R. E. Fulton  
Draft-rigging.....G. I. King  
Drawer. Cash.....A. B. Tomlin  
Drawing-roll clearer.....W. E. Keach  
Dredge. Submarine.....G. A. Overstrom  
Dredging earth. Apparatus for.....E. McGregor  
Dumb-waiters. Operating.....J. W. Kincaid  
Dust-collector.....R. Danvin  
Dye. Blue trisazo.....A. Israel et al  
Egg-carton.....J. H. Batchelder  
Electric conductors. Crossing for.....J. Floyd  
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## Trade-Marks in Europe.

Consul-General F. H. Mason, writes from Berlin to the State Department in regard to trade-marks in Germany, as follows: "It appears necessary to recall the attention of American exporters to a very peculiar provision of the German law for the registration of trade-marks, which is not infrequently used to the great and unjust disadvantage of Americans and other foreigners. Under the German statute, any person may register and secure right to any name or other device used as a trade-mark which has not previously been registered here by some other firm or person. In other words, the officials before whom the application is brought make no inquiry to ascertain whether the applicant has ever used the proposed trade-mark or has any right to it, but simply look over the record to ascertain whether it has been registered in Germany. If not, it is admitted to registration without further inquiry or delay.

"The readiness with which such a practice can be abused is apparent. When, several years ago, American bicycles began to be imported into Germany, certain persons interested in blocking the trade got the trade-marks of two or three makers registered in their own names, and obliged the legitimate American owners of the trade-marks either to buy them off—in other words, to pay a species of blackmail—or to change the marks on all bicycles exported to Germany.

"The obvious suggestion to all American exporters is that before exporting or seeking to export to Germany any kind of merchandise covered by a well-known name, whether registered in the United States as a trade-mark or not, they should have such name or trade-mark duly registered in this country, where all such rights are carefully protected and prosecutions for infringements easy and effective."



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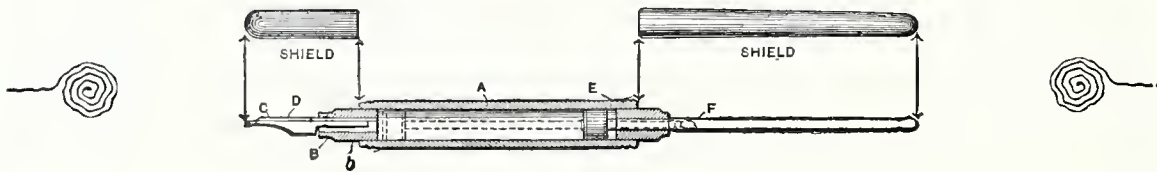
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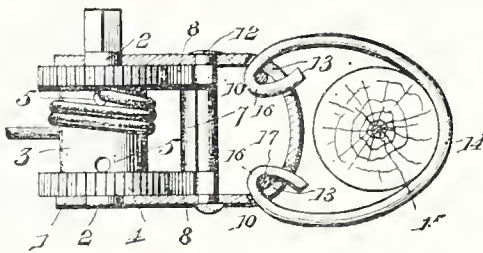
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## HYDRAULIC GOLD MINING.

### ALASKA MAY FURNISH A NEW FIELD FOR IT.

**The Wimer Company's Mine at Waldo, Oregon, Furnishes a Fine Example of the Effectiveness of the System.**

The gold discoveries in Alaska seem likely to give a new lease of life to hydraulic mining. Some thirty odd years ago this process was in its prime. The rich easy placers of California had been nearly worked out and it was necessary to find some means for wholesale work in washing enormous quantities of earth which was rich, but yet not rich enough to pay for the ordinary forms of working it. The means were found by Edward Mattison, of Connecticut, who utilized a cataract to obtain a "head" for a jet of water directed from a pipe against the side of a bank of earth. Under this attack, the bank crumbled away, and water and all ran into sluices, where the gold was caught and held. Hydraulic mining was born.

It soon outstripped the most sanguine hopes of its inventor. California is the land of mountains and mountain streams, and it has always been comparatively easy to get enormous "heads" for water supply. Brought in great open flumes which rode along the hill sides, spanning ravines and valleys like centipedes on dizzy trestles, emptying into pipes from one to five feet in diameter with a sheer fall of several hundred feet, and compressed at the bottom into a six inch nozzle, the force with which

it issues is something inconceivable to those not familiar with the facts.

Under this enormous pressure, the water becomes solid as a bar of steel, and can not be penetrated. Strike down on it with a club and instead of passing through, the club will be wrenched from your hand. Boulders weighing hundreds of pounds are tossed high in the air when struck by it, and it eats into banks at a rate almost unbelievable. Striking a man, the stream from a hydraulic nozzle will not only kill him—it will tear him to pieces. So frightfully strong is it

that it cannot be directed by hand, and systems of nozzles controlled by levers, known as "Hydraulic Chiefs," "Little Giants," Monitors," etc., have been devised to manage it.

For a time hydraulic mining seemed firmly established. But as time went on the disadvantages of the system became apparent. The debris washed down by it was enormous; it clogged the rivers, impeded and finally almost put a stop to all inland navigation. It began to fill up the few bays on the Pacific Coast. Then, when a freshet would come in the spring, the filled banks would overflow and great damage would be done. When the water receded, it would leave a cover, perhaps feet in depth, of unproductive gravel over what had before been fertile lands.

California was rapidly changing from a mining to an agricultural

state and the farmers and fruit growers put down their feet and said that hydraulic mining must stop. And stop it did.

It still continues in Oregon, however, where there is, as yet, no debris question. The illustration below is of a mine in that State, owned by W. T. Wimer and Company, which gives a fine illustration of the system.

The water supply consists of two ditches, each having head boxes 4x6 feet, one being two miles and the other 3¼ miles long, and affording an abundance of water for mining purpose for eleven months in each year. This mine is equipped with four "Giants," three locomotive head-lights, 8,000 feet of pipe, ranging in size from 11 to 60 inches in diameter, the major part of which is from 17 to 22 inches. There are also over 3,000 feet of 4x5 outlet flume. This mine is worked at least

eleven months in the year, employing about a dozen men and using from two to four giants.

The mine has been worked for some twenty-three years, but only recently has it been possible to take full advantage of its productiveness, which has been greatly increased by the completion of an outlet race, through which the water can be drained away after being used. The race is over a mile long and is sixty feet deep. It runs through low hills and heavy timber and has a 268-foot tunnel through bed-rock. The work has cost over \$100,000. This opening is the natural outlet to all the famous deep and rich gravel deposits in the Waldo district. One remarkable feature of the tunnel is that the



EXAMPLE OF HYDRAULIC GOLD MINE.



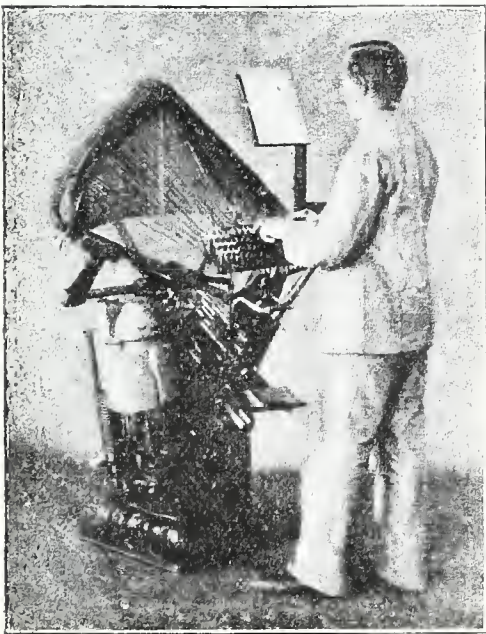
dirt and ore dug from it "paid" double the cost of the work.

In Alaska there is no danger of damaging the farmers for years to come—for there are as yet none to damage. There is plenty of water power, furnished by the rivers and melting glaciers. True, in the winter everything freezes and nothing can be done; but this is true of all other methods of work. As long as the placers continue as rich as they seem to be now, there is little use in employing the hydraulic method, which necessarily works on such a large scale that it loses a good percentage of the gold; but when the bonanzas are worked out and the miners come down to handling cheap dirt, it seems extremely probable that hydraulic mining will flourish there even more than it did in California.

### THE TYPOGRAPH.

Ever since Mergenthaler's epoch making invention of the linotype, inventors have been striving to contrive some equally good apparatus, which might enable them to acquire some of the millions of profits made by the lucky owners of the former machine.

The latest effort in this line is found in the Typograph, a German invention, which is said to be simple and which certainly has the merit of being much cheaper than the Linotype, the price of the latter, in Germany, being from \$2,500 to \$3,000 while that of the Typograph is only \$1500 to \$2000.



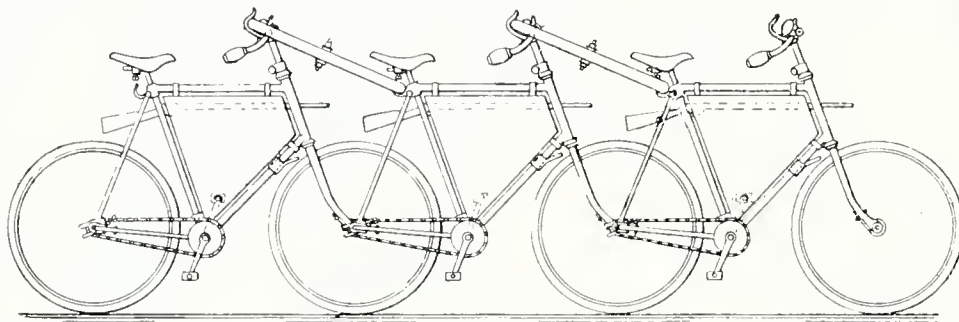
The Typograph is worked by hand, with an automatic fusion arrangement for the production of lines. It has a keyboard with 84 characters, and the matrix works by its own weight in a central groove. The necessary number of dies for the length of line desired are united in the central groove, and a prolonged stroke on the keyboard sets them in movement. As the matrix falls, the catcher seizes its foot and adjusts it precisely, so that an absolutely correct line is maintained.

The line is then moved by ingenious mechanism to the melting pot, which is filled with a liquid composition kept constantly at a uniform heat by means of gas burners disposed beneath it. The typemetal is spread over the matrix and allowed to cool. A pair of knives then slip over the mold and cut off the top of the line, which slips into a shuttle, and line after line is arranged in this manner, in columns.

### WHEELS IN WAR.

#### Cycles and Automobiles For Use in Battles.— The "Horseless" Horse.

A CONVERTIBLE MULTICYCLE:—The use of the bicycle in warfare is by no means new. Nearly every army, including our own, has its bicycle corps, whose members, however, in actual warfare, would probably have to be used for isolated duty, owing to the difficulty of preserving any sort of alignment except under the most favorable conditions and owing to the fact that the fall of a single man at the head of a bicycle column, would inevitably throw all the rest into more or less prolonged confusion. To avoid



this, some armies have adopted the multicycle, where four, six, and even twelve men ride behind each other on a single long drawn out machine. The difficulty with this is that the machines are clumsy, difficult to transport and awkward to handle. Accordingly, military men have been looking for a machine that will avoid these difficulties and think that perhaps they have found it in the interlocking bicycle, invented by Lieutenant O. I. Straub, of the United States Army.

This machine is simple enough. It consists of a series of what look like ordinary bicycles. Really, however, the axles of these are specially contrived so that the front wheels can be quickly removed and the front fork of one secured to the rear axle of another. This can be continued indefinitely, if desired, or until the supply of bicycles is exhausted, when a multicycle of indefinite length is secured. The front wheel, when removed, is placed as a brace between the handle bar of its own machine and the seat of the one just in front, thus lending rigidity to the whole. The machine can be changed back into a series of individual wheels in a few moments, if desired.

GUNPOWDER AUTOMOBILE:—A novel motor for automobiles has just been invented by a New Haven machinist and will be put on the market this winter. Instead of the usual gasoline, electricity, naphtha or steam for propelling the vehicle, the inventor substitutes gunpowder, and has been successful in the experiments he has already held with the new motor. The power is obtained by a series of minute explosions of the powder, which is kept in the rear of the vehicle and fed into the machine as in ordinary cartridge filling mechanism. The motor is said to be safe, and, though as noisy as a naphtha motor, is more easily managed and is cheaper. A ten pound can of powder has been proven good for a three hundred mile trip. The inventor claims for it a special superiority for army use or long jour-

neys, as the mechanism is extremely simple and the fuel cheap and easily obtainable.

THE HORSELESS HORSE:—A so-called "automotor horse," invented by M. Emile Langrenne, is described in "British Invention." This device is simply a motor concealed in the figure of a horse for use with ordinary street vehicles. Says the journal named above: "The motor mechanism, which is contained within the body of the horse, consists of one or two motors supported upon cross-bars and driving, through chains or belts, the shafts of the driving wheels mounted on the hind legs of the horse. The steering is effected by means of reins or rods held by the rider or driver, the neck of the horse being,

for this purpose, intersected and mounted upon ball bearings, the reins being attached to a cross-head mounted on a vertical spindle, to the lower end of which are attached arms contained within the fore legs and connected to the axle of the front wheel." The appearance of this peculiar automotor horse in the streets will probably cause something of a sensation.

AUTOMOBILE WAGONS:—At a meeting of an engineering association in Cincinnati, a good paper on the "Automobile Wagon" was read by Mr. Arthur Herschmann. After reviewing the different propelling agencies which have been experimented with, he comes to the conclusion that the steam wagon is superior to its competitors, for the following reasons:—(1) It has the greatest load and mileage capacity, or, in other words, radius of action; (2) its operation is independent of charging stations, and supplies necessary for the working of the wagon can be easily procured and taken aboard quickly. The operating expenses in the case of an electric (or, in fact, of any power storage system) vehicle, grow to be prohibitive as soon as a certain ton mileage capacity is exceeded, tending to keep such an electric wagon small in size. In the case of an oil wagon such economic restrictions to the size do not exist, and the objections to an oil wagon of large capacity are more by virtue of difficulties in operation. With steam the case is altogether different. The tendency is here to build large wagons, since with steam the weight of the machinery to be carried does not grow even in an arithmetical ratio to the carrying capacity.

MILITARY AUTOMOBILES—Lieutenant General Miles, commanding the United States army, in his annual report, renews his recommendation for the further use of the automobile in the army. He says that they may be adopted for use as couriers, carrying dispatches, movements of staff officers from one command to another, for small reconnoitering parties, for in-

vestigating the topography of the country in which the army proposes to operate, for small detachments engaged in constructing bridges or establishing depots, for rapidly supplying ammunition and for the movement and care of the wounded.

### Waste in Gas Making.

According to a writer in Cassier's Magazine, there is a fine field for inventive genius in the direction of economy in producing gas. He says:

"Under the best conditions obtaining at present, out of every 100 tons of coal delivered at gas works or electric light stations, something like 98 tons are absolutely wasted, as far as the production of light is concerned, and go to produce useless heat. When one considers the enormous quantity of coal used annually for the production of artificial illumination, the absolute waste of 98 per cent. of it seems little short of criminal. Will the problem ever be solved? It must be confessed that at present the prospects are far from being bright. Some means must be found of exciting ether vibrations between the visible limits only, and of eliminating the slow, radiant heat waves. Whatever method may be eventually employed, it is interesting to note that already, on a small scale, the problem has been solved by the firefly, the most delicate measurements having failed to detect any radiant heat in the light emitted by this little creature. Surely this ought to be an interesting subject for investigation by the physiological chemist, who, working in conjunction with the physicist, might enable us to get nearer the solution of this important question."

### The Cahill Typewriter.

There have been many unsuccessful attempts to devise a typewriter in which the real work is done by electricity, but none of them succeeded very well until the "Cahill" was put on the market. In this machine one electro-magnet impels all the parts, and so makes possible a touch less than one-tenth as heavy as that of non-electrical typewriters. The depression of keys is shallow, only about one-third that of non-electrical machines. The automatic release of the type-bar, which leaves it free to rebound instantly, insures a uniform clearness of printing otherwise impossible, and as all the type-bars are impelled by the same magnet in the same manner, they all strike always with the same amount of force. The greater power required for manifolding is given to the magnet by turning the rheostat handle to admit more current, without the least increase in the weight of touch.

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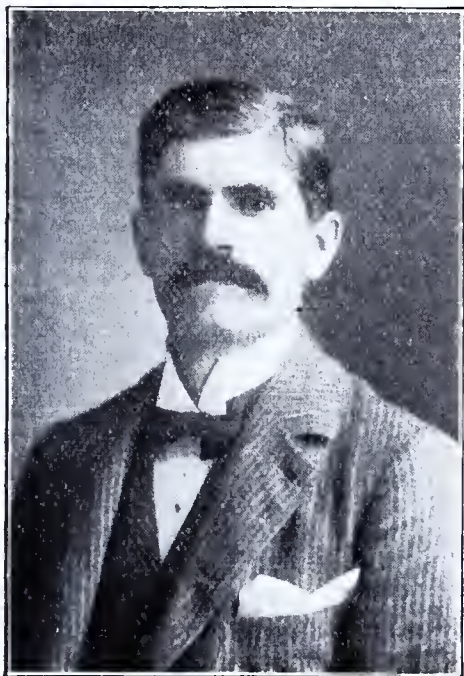


## A MECHANICAL GENIUS.

**Career of W. E. Symons, who Followed his Predilections to Success in the Face of Great Difficulties.**

The career of W. E. Symons, now superintendent of motive power on the Plant System of railways, and an inventor of constantly growing reputation, is a proof of what hard study under difficulties will achieve in this country.

Mr. Symons was born near Farm-land, Indiana, in December, 1859, and is therefore 41 years of age. His parents were of the old Orthodox Quaker religious faith. His bent for mech-



anics manifested itself at a very early age, but was frowned down upon by his parents, who objected to his leaving home to pursue it. Nevertheless, he persevered, and finally got a job as machinist apprentice at Richmond, Indiana, at \$3 a week, and was sent to Indianapolis the same year to the shops of his employers.

He soon found that while he could live on his \$3, it would not pay for tuition at the night school, nor would it serve to buy text books and technical papers, nor do other things necessary to fit him for enlarged usefulness afterwards. He had to have more money and there was but one way open. He secured a job at his boarding house at washing dishes, carrying coal and doing other servant's work, in return for which his board was reduced to a nominal sum, and his \$3 was saved for his precious studies.

For over a year, he and his room mate owned one white shirt between them, which they took turns at wearing when they wanted to be particularly stylish. Frequently, they had to lose precious hours of study because their candles and oil were exhausted and they had no more light to work by.

After finishing his apprenticeship, Mr. Symons went to Chicago, Illinois, and worked as machinist in marine shops and in the Chicago, Rock Island and Pacific Railway shops. In 1881 he went on the Great Lakes one year as assistant engineer, and four years as chief engineer, and still holds a chief engineer's license. All this time he kept on studying and taking lessons

from private professors in mechanical engineering.

In 1886, he went on the Wisconsin Central Railway as fireman, and after a few weeks was promoted to engineer. He ran there until 1887, when he went to California and ran on the Atlantic and Pacific Railroad as passenger engineer across the Mohave Desert.

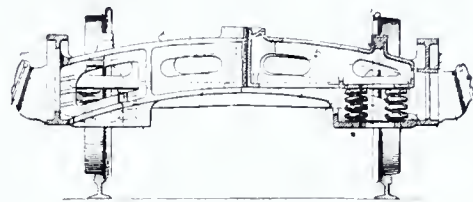
In 1889, he returned to Chicago, where he installed and operated an electric plant, afterwards, in 1890, returning to railroad work on the Santa Fe out of Chicago.

In 1891, he went to Arkansas City as Master Mechanic, and to Raton, New Mexico, early in the next year. Two years later, he had gained such a reputation for honesty and ability that he was nominated for mayor on the "moral reform" ticket and elected, receiving 590 out of the 600 votes cast. During his term the city water works were financed and the sewerage system built. He left Raton at the close of 1895 to go to the Mexican Central Railway as Master Mechanic at San Luis Potosi.

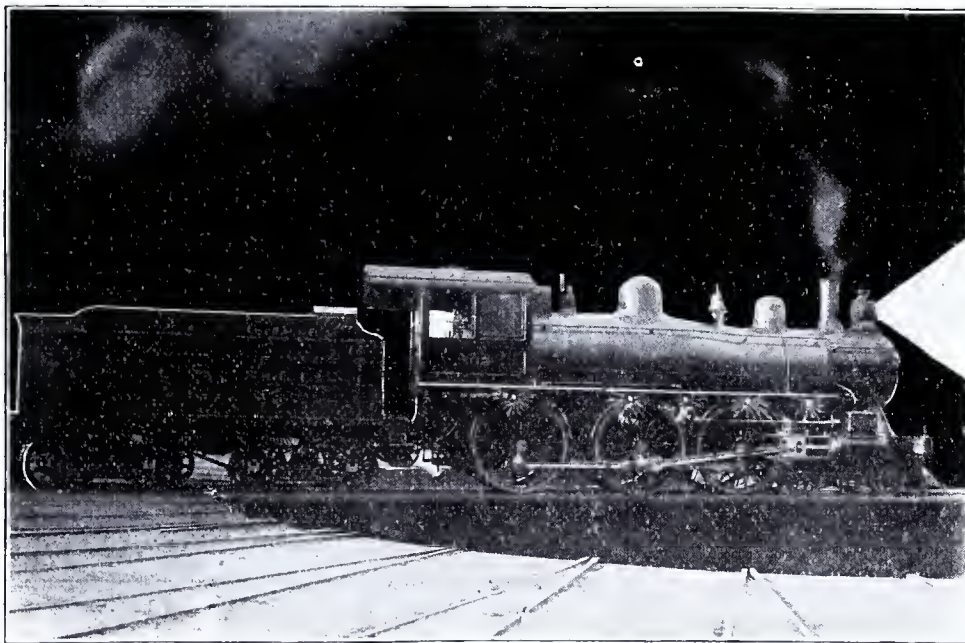
He left Mexico in 1896, and went with the Galena Oil Company in 1897 as mechanical expert and salesman, going to England and France for them, and finally returning to this country in July, 1898, to accept the position he now holds.

Mr. Symons is a member of the American Society of Mechanical Engineers, of the Franklin Institute, of the American Society of Railway Master Mechanics Association, of the Marine Engineers Association, and of several mechanical and technical clubs, among them the Southern and Southwestern Railway Club, of which he is President. He is considered one

His invention has for its object the production of a truck embodying a complete truck-frame cast in a single piece in which the bolster-channel will permit of the mounting of the truck-bolster entirely within the connecting member of the truck-frame as distinguished from what are known as "pedestal-trucks." In this latter type the truck-bolster is located within the connecting member or center bar, but its opposite ends project through the side bars, which serve as column-guides for its vertical movement.



In the Symons truck, the bolster is located entirely within the center bar, which latter is cast with drop-seats for the springs which support the bolster. This construction obviates the necessity for "jacking up" both the truck and the car when it is desired to remove the wheels from the truck-frame. In addition to these features, the journal-box recesses or openings open to the front and rear, so that the boxes may be removed by withdrawing the axles without elevating the frame. He has also contrived a simple device by means of which the key which serves to lock the journal-box in place, also actually exerts a direct pressure upon the box, tending to constantly urge it to the inner end of its seat. Those familiar with the art will readily appreciate the advantages of this system of construction.



ENGINE NO. 107 OF THE PLANT SYSTEM, BUILT FROM SPECIFICATIONS BY W. E. SYMONS.

of the best presiding officers that the club has ever had.

As an inventor, Mr. Symons ranks very high. His latest patent relates to an improved car-truck of the general class known in the art as "cast-steel trucks." As applied to a number of trucks known by this designation, the term is a misnomer, because they are either a combination of wrought and cast steel elements or, if made entirely of cast metal, are constructed of a number of parts secured by bolts or the like.

### EDISON'S GREAT INVENTION.

Thomas A. Edison is said to have announced that he has perfected an apparatus for the economical and satisfactory reheating of compressed air. If the report is correct, and if Mr. Edison has made no mistake as to his success, the invention will probably revolutionize all existing industry.

William L. Saunders, the editor of a technical magazine devoted to the scientific and commercial exposition of compressed air, has been for some time confident that Edison was ap-

proaching this very difficult problem in a manner that gave promise of a satisfactory solution. One of the chief drawbacks, perhaps the only remaining one that is important in the commercial use of compressed air apparatus, has been the difficulty of reheating the air after compression, as well as the considerable expense and waste which all reheating apparatus up to this time has entailed.

Mr. Saunders, who is an expert authority of very high character, is persuaded that Edison has done away with this difficulty and that in doing it, may have hit upon a method by which nearly all the energy that is in coal may be entirely utilized for commercial ends. That is a secret which chemists and scientists have for many years been occupied in penetrating.

Four or five years ago Edison stated that he proposed, after he had perfected his method of extracting iron ore by means of an electric process, to devote his attention to a problem whose solution would enrich the world, in his opinion, to a greater extent than any other scientific discoveries, excepting, possibly, the utilization of steam telegraph.

That problem involved the discovery of a method of saving all of the energy that is in coal, or, at least, most of it. "All the world knows," said Edison, "that there is a dead loss of from 80 to 85 per cent of the energy that is in coal when it is transformed into steam or electric power. If we can save that—if it would be possible, for instance, to send a steamship across the ocean by the use of 100 tons of coal instead of 500 tons a day—it is easy to see how vastly would be the cheapening to all fields of industrial energy."

He was not the only man who proposed to work upon this problem. Not long ago at the Columbia University laboratory, an experimental lecture was given by a scientist who actually saved 80 per cent of the energy that is in coal, but his apparatus and method were so expensive as to make the discovery of no commercial value. So, in Europe, chemists and scientists for years have attacked this problem whose satisfactory solution promised to give to him who reached it not only immortality, but also great riches.

Now, Edison says that in solving the problem of reheating compressed air he has unexpectedly discovered how to utilize at least 99 per cent of the energy that is in coal. He says that his apparatus not only perfectly and cheaply reheats compressed air, but that it does it through the utilization of a little over 90 per cent of the energy of coal—that is to say, with one-ninth of the amount of coal that was necessary under the old apparatus, such as steam boilers, to get a given power, he can by means of this new apparatus secure the same power.

This announcement seems almost too momentous to be possible.

If true, it seems probable that we are on the eve of a vast revolution tending greatly to cheapen the cost of production and vastly to increase the wealth of the world. Edison asserts that the apparatus is already successfully applied to steam drills and exhaustive experiments are soon to be made with it upon compressed air driven street cars and marine engines.



## Progress of Invention.

### LIGHTING.

**GAS EXPOSITION IN VIENNA:**—Vice-Consul-General Hogue sends from Vienna a translation of a communication from the managers of the first gas exposition ever held, which will be opened at Vienna in June, 1901. The exposition is intended for the purpose of showing not only to professionals, but to consumers, the extraordinary progress made in the industries mentioned during the last decade. It will be very comprehensive and will show the historical developments in the gas and water department industries. Shops of the various branches of industry, completely furnished and in working order, will demonstrate the advantages of gas as a motor power.

In all parts of the world, electric expositions have taken place during the past decades, but never, since the invention of gas production, which celebrates its centennial anniversary in the year 1901, has a large and special exposition, embracing all departments of gas and water technics, been arranged.

The production of gas will form the principal division of the gas industry department and will comprise all the various methods of producing it—from anthracite coal, from water, oil, garbage and air, as well as acetylene, besides the machines and plants requisite for the production. In another department, all contrivances for lighting, heating and cooking purposes, especially those adapted for use as motors, will be exhibited.

**NEW ELECTRIC LAMP:**—Among the novelties at the Paris Exposition was the so-called "Nernst" electric lamp, displayed by a Berlin company. The chief characteristic of the lamp is the employment of a filament made from an oxid of the rare earths, as, for instance, magnesia, which is a nonconductor of electricity at the ordinary temperature. Such bodies have long been used in gas-lighting, in the well-known forms of the incandescent mantle, and this suggested to Professor Nernst their employment in electric lighting. It is necessary, in this lamp, to heat the filament before it will glow, and this is one of the disadvantages of the system; but the filament, being noncombustible, does not need to be enclosed in a vacuum bulb, which is of course vastly in its favor. The preliminary heating may be done with a match or alcohol torch, or may be accomplished automatically by the electric current; but the self-lighting lamps are much more expensive than the others.

**TIME ELECTRIC LIGHT:**—A German firm has recently brought out a type of incandescent lamp which can be set in advance to burn a given number of hours and then automatically extinguish itself. In the base of a lamp is fixed a copper tube filled with a solution of sulphate of copper and containing a central part of copper wire. A current is arranged to pass through this solution from the wire to the tube, so that a continual electrolytic solution of the wire takes place. As soon as the wire is all dissolved the current is broken and the lamp goes out. The

size and length of the wire may be set for any given number of hours and the lamp thus becomes automatic in its action.

**ACETYLENE GAS HEADLIGHT:**—The extreme beauty of the powerful yet soft light derived from use of acetylene gas generated from the calcium carbide has led to many endeavors to use it in the locomotive headlight. The great impediment to be overcome is the regulation of the water supply which is necessary to be fed to the carbide in a small but constant quantity. The jarring of the locomotive while at speed renders it difficult for the necessarily delicate water feeding arrangement to cover the conditions. On the Southern Pacific Railway, however, a locomotive has for the past five months been equipped with an acetylene gas apparatus which is said to be given excellent service. It does not flicker under any conditions, clearly reveals objects 300 feet distant, and seems to penetrate fogs exceptionally well. The apparatus was devised by Mr. E. R. Cook, of Sacramento, Cal.

**NEW RAILWAY CAR LIGHTING SYSTEM:**—The Atchinson, Topeka & Santa Fe Railway Company went into the matter of electric lighting its passenger equipment more extensively than has been done on any other line. Three years ago about 100 coaches of all classes were equipped with an axle lighting system. As a result of the imperfection of the system, a few months ago the electrical equipment was removed from all these cars. Now, however, the company has decided to make a trial of a greatly improved axle lighting system, and twelve cars are to be fitted with the new apparatus. Five of these cars are now in service. When the dozen cars are equipped the test will begin. The cars will be kept in continuous service for six months, and if, after the end of that time the system has given satisfaction, it will be generally adopted. The first cost is about \$750 per car.

**HEAT FROM INCANDESCENT LAMPS:** The heat generated by an incandescent lamp, says a German writer, is much underestimated by the general public. Experiments have shown that a small incandescent lamp placed in a vessel containing half a quart of water will heat the latter to boiling point within an hour. Celluloid brought into contact with an incandescent lamp will ignite in a few minutes. It is also very dangerous to place the lamp in the proximity of cotton wool, which soon scorches.

**A NEW GERMAN PETROLEUM LIGHT:** Consul Hughes, of Coburg, Germany, writes to the State Department that according to a report from the village of Simmozheim, in Wurttemberg, a new lighting system has been installed by the Washington Light Company, Limited, of Elberfeld, called the "Washington light." The oil from which the light is produced is distributed to the different lamps from a central petroleum reservoir, through heavy copper pipes, and is vaporized by a special apparatus and burner. The light is very brilliant and steady, and, as a very limited quantity of oil is used, the cost is slight.

## IMPORTANT COURT DECISION IN PATENT AND TRADE MARK CAUSES.

Supreme Court of the United States.

**SAXLEHNER v. EISNER & MENDES ONL COMPANY.** Decided October 15, 1900.

1. **TRADE-MARK** — "HUNYADI" FOR MEDICINAL WATERS—PROPER SUBJECT OF TRADE-MARK.

The name "Hunyadi" being neither descriptive nor geographical, but purely arbitrary and fanciful as applied to medicinal waters, was the proper subject of a trade-mark.

2. **SAME—SAME—ABANDONMENT.**

Held with regard to the defense of abandonment that there is but slight evidence of any personal intention on the part of Saxlehner to abandon the use of the word "Hunyadi" or to dedicate the same to the public.

3. **SAME—SAME.**

To establish the defense of abandonment, it is necessary to show not only acts indicating a practical abandonment, but an actual intent to abandon. Acts which unexplained would be sufficient to establish abandonment may be answered by showing that there never was an intent to give up and relinquish the right claimed.

5. **SAME—APPROPRIATING PART OF A TRADE-MARK — INFRINGEMENT.**

It is not necessary to constitute infringement that every word of a trade mark should be appropriated. It is sufficient that enough be taken to deceive the public in the purchase of a protected article.

6. **SAME—SAME—LACHES.**

Where the party who originally adopted the trade-mark "Hunyadi" was inactive and permitted the use of the word by numerous other importers for twenty years, Held that it is now too late to resurrect the original title which has been lost by laches.

7. **SAME—SHAPE OF BOTTLE—LABEL.**

Held that that the defendants infringed the shape of the bottle and the label of the complainant, and they are restrained from their further use.

8. **SAME—ABANDONMENT—LACHES.**

Where the defendants adopted the shape of complainant's bottle and also his label with intent to deceive, Held that they are restrained from further use thereof, although the plaintiff delayed for several years from bringing suit against them.

Supreme Court of the United States.

**HUBBEL v THE UNITED STATES.** Decided October 22, 1900.

1. **HUBBELL—METALLIC CARTRIDGE—CONSTRUCTION OF CLAIM — INFRINGEMENT.**

Letters Patents No. 212,313, granted to William W. Hubbell, for an improvement in metallic cartridges, given a limited construction and Held that the cartridges made and used by the Government were not within the description contained in the claim.

2. **CONSTRUCTION OF CLAIM—CLAIMS INTERPRETED BY THE ACTION ON THE APPLICATION.**

A claim as allowed in the patent must be read and interpreted with reference to the rejected claims and to the prior state of the art and cannot be construed to cover either that which was rejected by the Patent Office or disclosed by prior devices.

3. **SAME—SAME—MERE CHANGES OF EXPRESSION.**

Where a difference between claims as made and as allowed consists of more changes of expression having substantially the same meaning, such changes made to meet the views of the Examiner ought not to be permitted to defeat a meritorious claimant. While not allowed to revive a rejected claim by a broad construction of the claim allowed, yet the patentee is entitled to a fair construction of the terms of his claim as actually granted.

4. **SAME—SAME—MATERIAL ELEMENTS OF THE COMBINATION.**

If a claim to a combination be restricted to specified elements, all must be regarded as material, and limitations imposed by the inventor, especially such as were introduced into an application after it had been persistently rejected, must be strictly construed against the inventor and in favor of the public and looked upon as in the nature of disclaimers.

Court of Appeals of the District of Columbia.

**ECLIPSE BICYCLE COMPANY v. FARROW.** Decided June 5, 1900.

**CONTRACT BASED ON UNPATENTED INVENTION—ACCOUNTING—ROYALTY.**

Where a company agreed in consideration of the sale to it by F. of all his interest in an invention for which two applications for patent were pending in the Patent Office, to pay him royalty on each device manufactured and to use due diligence in manufacturing and selling, and the company's attorney took charge of the prosecution of the applications, and the manufacture of the device was begun and it was extensively advertised, but subsequently M., an officer of the company, obtained a patent for a device effecting the same purpose as that of F., whereupon the company ceased to make the latter's device and substituted that of M., and one of F's applications after being allowed was placed in interference with other applications and was abandoned by the failure of the attorney to prosecute it and the other application was allowed to become forfeited by failure of the company to pay the final Government fee, and meanwhile the company became the owners of another patent claimed to dominate the devices of both F. and M. under which it continued to manufacture the device of M., and on the failure of the company to make any returns or render any account F. instituted proceedings for an accounting. Held that a decree holding F. entitled to royalty from the company for the devices manufactured under M's patent, as well as for those professedly manufactured under its contract with him, and directing a reference to the auditor for statement of such account should be affirmed.

# PATENTS

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## DRILL AND DREDGE.

### NEW DEVICES THAT ARE EXCITING COMMENT.

The Brandt Hydraulic Machine for Boring the Simplon Tunnel and Bates Boats for Keeping River Channels Free.

When in the fifties the project of drilling the great Mount Cenis Tunnel fathered by the courageous Italian Minister of State, Cavour, was undertaken, no machines for drilling were in existence, and it was calculated that a period of twenty years would be necessary for every three miles of tunnel drilled. Then Engineer Sommeiller, in charge of the work, constructed the first drilling machine; and, although crude, it was satisfactory enough to accomplish ten times the work done by manual labor, and enabled him to finish the tunnel in eleven years. The longer St. Gothard Tunnel was afterwards finished in from eight to nine years.

Now another great tunnel is being excavated to furnish a third connection between Italy and the rest of the continent, and shorten the distance from Rome to Paris by about forty-five miles. Work on the "Simplon" Tunnel was begun November 13, 1898, and, according to contract, was to be completed in five and a half years, at a cost of about \$13,500,000. Its length will be 12.4 miles, compared to the eight miles of the Mount Cenis,

in battery form. Prominent engineers have come from far and near to examine this powerful mechanism.

Another of Mr. Brandt's inventions is a machine for loosening and removing the debris after the explosions and blasts. It throws a powerful stream of water in a jerky manner into the stones loosened by the force of the blasts, thereby washing away the dirt and making excavation easier. These machines run on rails, and when in use follow each other in rotation.

The historical museum of the Kaiserlich and Koniglich State Railroads in Vienna possesses the first hydraulic rotary machine invented by Brandt, which he used in tunneling through the Arlberg, in Austria, in 1867. It furnishes a striking contrast to the present great apparatus.

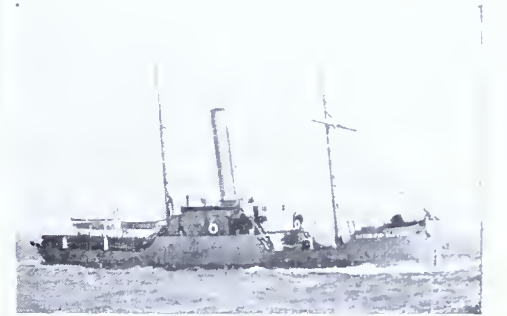
Mr. Brandt has also devised a somewhat new method of tunneling, according to which he digs two tunnels side by side within the radius of the excavation, but separated from each other by a dividing wall. One tunnel is always kept about 50 feet in advance of the other. At distances of about 650 feet, transverse connections between the tunnels are made through the dividing wall and are provided with doors. To obtain sufficient ventilation, powerful air blasts are blown into one side of the tunnel, which return through the other side of the divide, and thereby conduct out-

branch in which they have universally been admitted to excel the world is hydraulic dredging, four big dredgers, constructed on the system devised by L. W. Bates, of Chicago, having just been built in Great Britain for service in various parts of the world. The third and largest of these, the Hercules, has just had its trial trip on Tyne, and has caused a good deal of comment in Great Britain, where it is a novelty. The first left the Tyne in May last for Calcutta, and the second left last month for Rockhampton, Australia, the latter being an Australian government order. These boats are used to make and keep clear navigable channels in harbors and rivers, which are in constant danger of being silted up with sand or mud.

The Hercules, internally, has a most ingenious arrangement of mechanism and devices for dredging purposes. In the fore part of the vessel there are two large suction pipes, which pass through the bottom of the ship. These pipes can be lowered to any depth desired and can as easily be raised. On the end of each there is fixed a rotating vertical cutter, a clever device for cutting into and loosening the sand or whatever material upon which the dredger may be at work. These cutters are operated each by a 250-horsepower compound engine, and as they loosen the sand or mud, as the case may be, it is drawn into the suction pipes by a powerful centrifugal pump,

the bows, passing right down through the hull of the ship, constitute no unimportant part of the gear, for these may be used to hold or pivot the dredger when the cutters are in motion.

On the port side of the Hercules there is fitted what is termed a side trailer. This is also used for dredging and can be operated either in conjunction with the cutters or by itself. The side trailer has no cutter device and acts entirely by suction, promoted by the centrifugal pump, to which it is connected. It disposes of the sludge



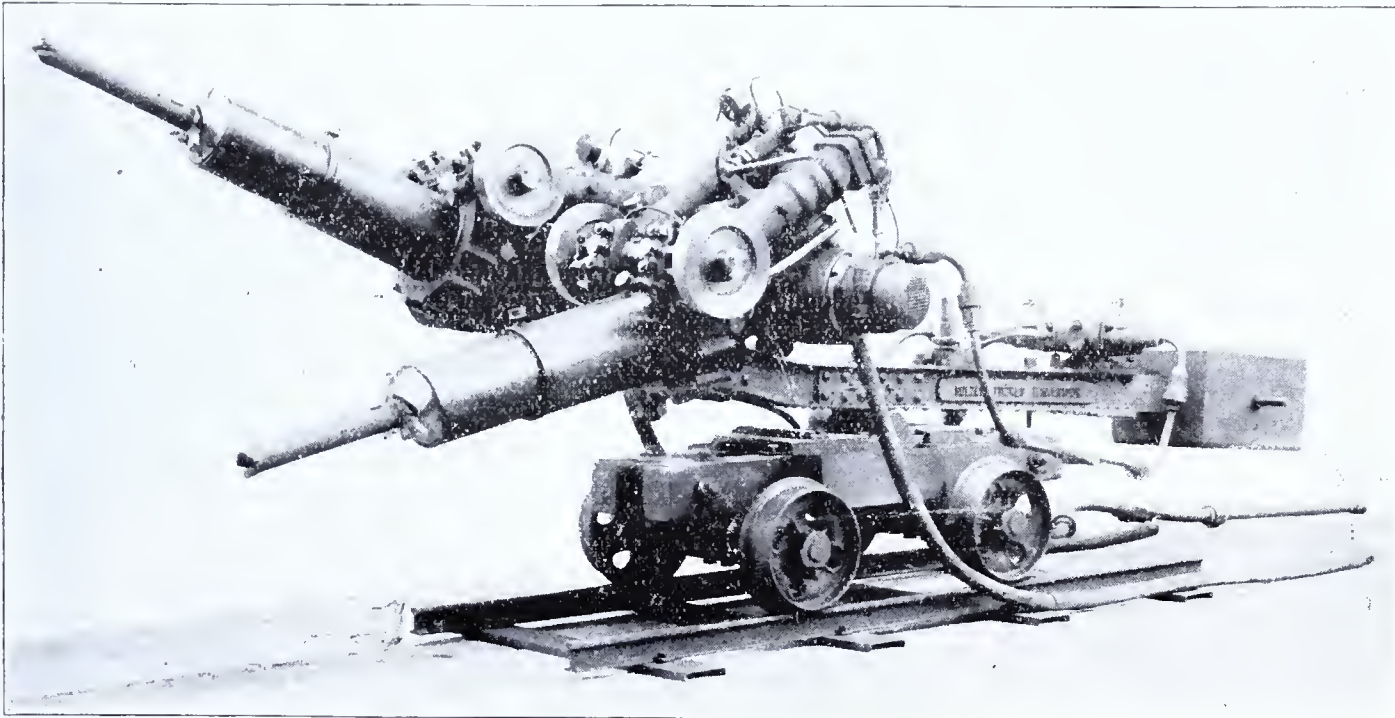
THE BATES DREDGER.

through the same medium as the bow "suckers"—that is, through the discharge pipe at the stern.

According to a more technical description, which applies particularly to the Calcutta dredger, the mechanism consists of a hollow rotary milling cutter at the end of a suction ladder, capable of work at varying depths, the extreme being 32 feet below water level. The spoil is discharged by the pump through a system of floating pipes, incased in elliptical pontoons and connected flexibly by means of the Bates ball-and-socket joint, packed with pneumatic tubing, which has been found greatly superior to the flexible rubber or leather joint pieces usually employed.

The end of the discharge pipe line is formed by a pontoon of special shape and adapted for connection to shore pipe, or else for discharging into the water. In this case, the motion necessary for distributing the dredged material is imparted to the pontoon line by a hydraulic distributor, which also forms one of the special features of the system. The dredger is adapted for working either straight ahead or for radial dredging. In the latter case it is anchored by one of two spuds or vertical anchors, alternately; and swung through the arc requisite to obtain a channel of the desired width.

The machinery comprises the main pumping engine, driving the sand pump, the propeller, the cutter engine, a hoisting engine for raising and lowering the suction ladder, and a similar engine for lifting the spuds, steering engine and the usual auxiliary machinery, with the addition of a force pump, which supplies filtered water to all bearings placed under or in contact with sandy water, so as to exclude grit from the working surfaces. The cutter is of the usual Bates form, and consists of twelve knives made of steel plate, and forming a hollow cylindrical milling cutter. The dredging pump has a steel runner and a cast-iron casing, made in five pieces, which experience has shown to require renewal at different times. The capacity of the dredge is from 300 to 1,000 cubic yards per hour.



BRANDT HYDRAULIC DRILL USED IN SIMPLON TUNNEL.

and the nine and one-third miles of the St. Gothard.

The Simplon Tunnel begins in Switzerland near the little town of Brig, in the valley of the Rhone, Canton Wallis, and ends in the valley of the Diveria, on the Italian side near Isella. It will be perfectly straight, except for a small curve at the ingress and egress.

The contract for the tunnel provides for a fine of \$965 per day if the time limit is exceeded, while a gratuity of the same amount per day is to be given if it is finished before the stipulated period. In order to expedite the work as much as possible, Engineer Brandt, who has charge, has invented a hydraulic rotary drilling machine, illustrated herewith, by which it is hoped to complete the tunnel in less than contract time. It is used singly and

ward all foul air and bad gases. When the air in the interior increases in heat, it is cooled by showers of cold water, which has been led from the exterior of the mountain under high pressure. Through practical experiments in the mines of Spain, Engineer Brandt has proved that the temperature of the air can be reduced sixty degrees by this means. The miners, therefore, always work in an artificial atmosphere of cool fresh air. The same streams furnish 1,000 horsepower for driving drills.

### A BIG DREDGE.

American engineers have long held a deservedly high place in the world's estimation and their designs are being more and more adapted in lines of work where magnitude and strength are especially required. The latest

driven by an engine of 1,500 horsepower.

After being sucked up in this fashion, the dredged material passes through a pipe running the length of the ship and is discharged through a discharge pipe projecting from the stern. By this means, and by the attachment of additional lengths of pipe, connected by patent joints and floated on a pontoon, which may be deflected by utilizing the discharge of water, it may be thrown to a considerable distance on either side of the channel dredged. There is however, an alternative arrangement by which the material can be deposited on either bank of the river to a distance of 4,000 feet from the dredger.

The anchor spuds—huge bulks of timber 60 feet long and 24 inches square—two at the stern and one at



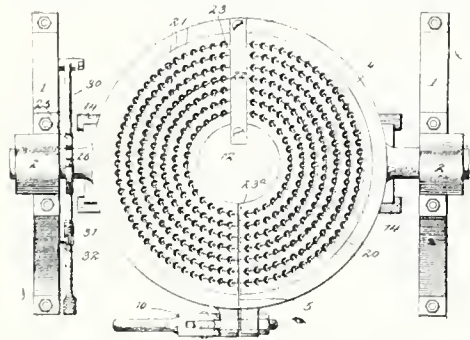
## CLEVER NEW PATENTS.

**Ingenious Devices Intended to Supply Long Felt Wants—Crayon Mold, Cotton Press, Animal Trap, Horse Shoe and Churn Dasher.**

### Crayon Making Machine.

Most people probably think that it is an easy thing to mold the crayons which are used in such large quantities for blackboard work in the schools, and will be surprised to find how complicated the required machinery may be. A new apparatus for the purpose, designed by J. C. Schueffler and B. P. Sexton, of Sandusky, Ohio, simplifies the usual machinery somewhat, although it still leaves it complex enough to satisfy anyone.

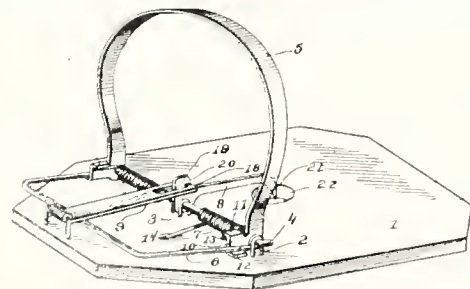
The illustration shows the molding bed, 4, supported on legs 1, 1, by trunnions, 25. The bed is made up of a series of concentric annular rings,



23, each of which is cut through along the line 23a. A clamp, 10, tightens the outer ring of the bed around the others and holds them immovable when desired. Along the edges of the annular rings are a series of molds for the crayons, into which the material can be placed in a semi-fluid state and allowed to harden. Then the clamp, 10, is released, loosening the rings slightly. Under the molding bed (not shown in the illustration) is a series of cams, which, when revolved, alternately raise each annular ring slightly and then let it fall, thus thoroughly loosening the crayons from their cylindrical molds. Then, the whole molding bed is revolved on its trunnions, 25, and the crayons allowed to fall out of it.

### Animal Trap.

A cheap and handy trap for killing small animals such as mice and the like has been invented by C. B. Trumble, of Groton, N. Y. Referring to the accompanying cut, 1, is a base either of wood or metal on which is secured a transverse pintle 4, on the ends of which a movable jaw 5, and bail 6, are loosely fixed. Strong springs, 11, are wound around the pintle and secured to the jaw and bail.



The ends of the springs bear against the base at 14. When the movable jaw is lifted to the position in the illustration, the spring is contracted and tends to throw it violently down again. This is prevented by the trig-

ger 9, which holds down the bail 6 and is itself held by the arm 19 of the bait lever 8. When an animal touches the bait, this lever moves and releases the trigger, which in turn releases the bail and the springs at once drive the movable jaw down upon the animal, killing it instantly.

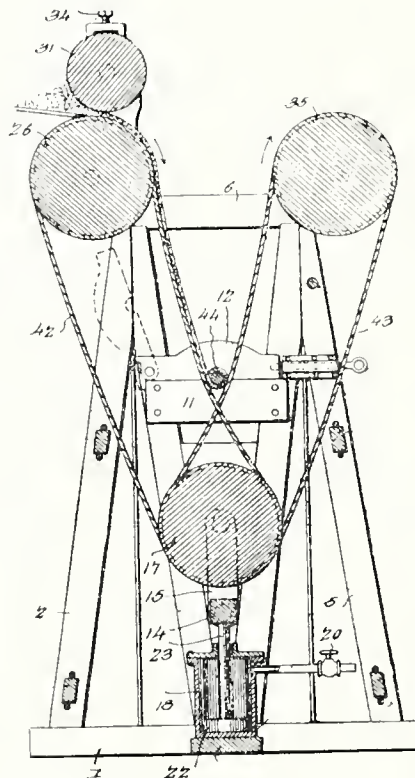
### Cotton Press.

No week passes without the patenting of some new device for a roller cotton compress, designed to produce the round bale, which has become so popular nowadays, and each invention seems cleverer than the last. The one illustrated below is not only most ingenious but is also simpler and much cheaper than most others. It was invented by W. T. Bessonette, of Temple, Texas, and its characteristic feature is that it does away with the compressing rolls generally used, substituting therefor a series of ropes that press the cotton web tightly to the core as it is wound thereon.

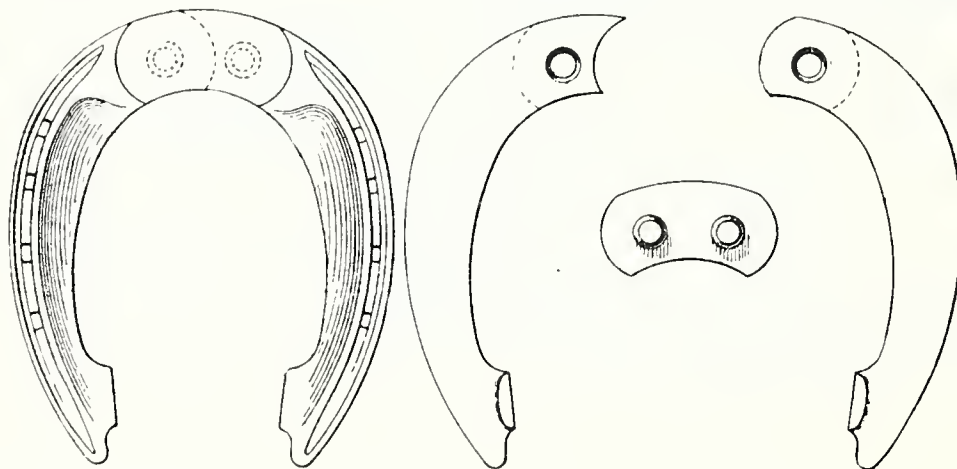
Referring to the illustration, 31, 26 and 35 are rolls fixed in place; 17 is a roll that is connected with the piston rod 23 of a steam cylinder 18 and that can be moved up and down. Two series of ropes (which alternate with each other) are shown at 42 and 43 and the core rod, 44, on which the cotton is wound, is supported between them, its ends being supported by bearings, 11.

The cotton is fed in between the rollers 31 and 26 and passes downwards, supported by the ropes 42, to the core rod, 44, on which it is wound. The ropes 42 continue downwards, passing around the roll 17 and returning back to the roll 26. The other series of ropes, 43, are actuated by the friction of the roll 17, and pass

over the roll 35. Between them—42 going down and 43 up as indicated by the arrows—they turn the core 44 and cause the cotton to wind upon it.



Disregarding the action of the steam cylinder for the moment, it is evident that the pressure on the growing roll must be proportional to the weight of the roll itself, increasing as this grows larger and bears down more and more heavily on the ropes. Soon, it will force the ropes apart and therefore begin to lift the roll, 17, and the steam piston below it. Pressure can then be applied either above the piston to force it down and increase the compression, or below it, to lift it and lessen the compression.



### Jointed Sectional Horse Shoe.

A horse shoe which has attained quite a success has been patented by Mr. James B. Hague, of Horseheads, N. Y. It is so designed as to permit its expansion after it has been applied to the hoof, so as to adjust itself to varying conditions of use.

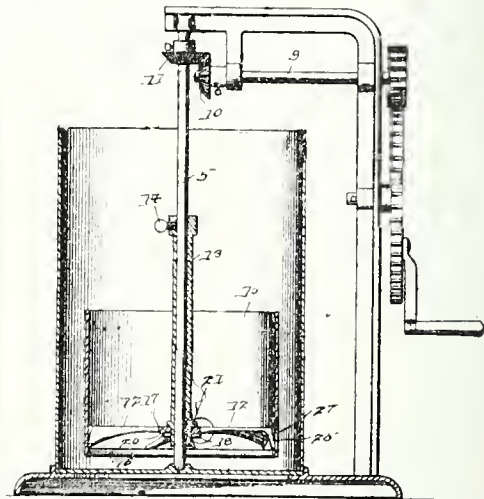
It is composed of two half sections pivotally connected to the front calk. The under surface of the shoe is beveled inwardly from the channel, in which the fastening nails are secured so as to cause the half sections to spread under pressure, thereby expanding the hoof. As an additional means of spreading the hoof, upstanding clips are formed near the back of each section of the shoe to bear against the inside of the hoof.

The device meets the conditions required of a shoe of this class, and every lover of a horse should aid in bringing this valuable invention into more extensive use. If humane societies really understood the comfort that this type of shoe gives, they would seek to have it adopted to the exclusion of the usual barbarians contrivance. Such societies can render no greater benefit to their cause than by giving attention to the proper shoeing of "man's best friend" in the animal kingdom.

Responsible parties who may wish to learn more about the shoe are referred to Mr. Hague, who is anxious to have a company formed to manufacture and sell the shoe on a larger scale than he is at present able to do.

### Churn Dasher.

Out of the hundreds of inventions, for use in the dairy, only a few stand pre-eminent, most of them failing to show any real improvement on the old familiar articles to which our grandfathers were used. A recent churn-dasher, however, invented by E. R. Franklin of Austin, Texas, seems to mark a decided improvement in the art. This dasher is so constructed as to agitate the cream more thoroughly than any other device with which we are familiar, thus effectually intermingling the air with it and causing the speedy formation of the butter. This is done by a series of radial blades, 12, preferably four in number, which are twisted or beveled so as to cause a downward current in the cream. Other details of the construc-



tion cause currents in the cream outwardly and upwardly along the sides of the dasher and then downwardly through it, thus agitating it most thoroughly. The method by which the dasher is turned will be readily comprehended by a glance at the illustration above.

## PATENTS

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## PATENT OFFICE.

## DIVISION XI.

Boot, Shoe and Leatherworking Machines. Hand Work has Almost Entirely Disappeared, even on a Small Scale.

Three hundred and fifty million pairs of boots and shoes are manufactured in the United States each year, and nine tenths of these are made by machinery, which is being continually improved in all its thousand and one tiny details. With this machinery Division XI has to deal, and it finds its hands full in doing it.

Fifty years ago shoes were made by hand. Then there crept in certain sorts of small machines for quick work on some of the minor parts of the process. These proving successful, other and more complicated ones were devised and extended again and again until hand work has been nearly eliminated. From the moment the leather is brought into the factory nowadays, until it goes out of it in the shape of a finished shoe, it is handled almost exclusively by machines. The uppers are cut out and put together by machines; the button holes are stitched and the buttons, eyelets and lacing hooks are all fixed in place by machines; the inner soles are prepared and fixed to the uppers by machines, and the outer soles are sewed on by machines; heels are cut out, compressed, and nailed to the shoe by machines; in short it requires careful search to find any detail that is not attended to by some ingenious piece of mechanism.

Division XI originally had charge of all methods of and machinery for, manufacturing leather from hides and skins, of all boot and shoe making machinery, and of a large share of all leather articles. This field of invention soon grew too large for one division, and many leather products

ations were the most difficult ones to successfully accomplish by machine, yet now hand operations are almost entirely eliminated. Time was, and not so long ago, when lasts were made in a single piece, save for a small in-step block, and shoes were frequently injured and bent out of shape in removing the lasts from them after they were finished.

Later, the divided or sectional last began to come into use, enabling the last to be removed piecemeal without damage to the shoe. Then followed, within the last few years, the invention of the foreshortening hinged last, by which the heel part can be turned upwards and the whole thing slipped out as easily as you please. This seems such an obvious invention that the wonder is that no one thought of it sooner, and that manufacturers were so slow in adopting it after it had been invented. This hinged last now bids fair to substantially supercede all other forms.

Another important section of the work of Division XI concerns itself with Button, Eyelet, and Rivet Setting. Most people can easily remember the time when it was necessary to lace up their shoes by painfully poking a string, usually a soft one with a split end, through an interminable series of holes that were too small for it in the first place. Then some benefactor of the race invented a tip that would not come off the string under normal conditions, and somebody else contrived the hooks which are now almost universal on men's shoes. Other inventors patented rims for what button holes were left—rims that would not split and fall out. Button fastenings were also contrived, warranted not to give away, sometimes, alas, not fulfilling their warrant, but always doing so, far better than the old sewed buttons.

Many efforts have been made to so modify these fastenings as to give women the benefit of them,

that do away with the jolt almost altogether.

A large share of the applications for patents in this Division come from New England, where the shoe factories and the shoe machine factories are mostly located. Apparently most of them come from workers in the latter class rather than from those in the



JAY F. BANCROFT.

former, although some of the most successful inventors in this line have grown up in the shoe making business. But usually, it would seem, the shoe makers content themselves with informing the machinery makers in what respect their machines are deficient, or with pointing out in what particulars improvements are desirable, and then leaving it to the latter to modify existing machinery to meet the demands.

Jay F. Bancroft, the chief examiner of the division, is a native of Minnesota, but has been a resident of this city for many years. He studied law at the National University here and entered the Issue Division of the Patent Office in 1881. He was steadily promoted, attaining to his present post about four years ago. Owing to his wide information, he was selected by Commissioner General Peck to serve on the international jury of awards at the Paris Exposition and spent five months of the past summer in that country. He is a member of the bar of the Supreme Court and of the courts of the District of Columbia.

During his absence, his place in charge of the division was taken by I. P. Disney, of Maryland, principal assistant, who studied law at the Baltimore Law School, and came to Washington, entering the Patent Office in 1890. He has been in Division XI ever since he became connected with the service.

L. Z. Thompson, of Pennsylvania, is the second assistant examiner. He has been in Division XI for eight years and in the Patent Office for twenty-three, having entered as a messenger boy in 1877 and having worked his way steadily up. He is a graduate of the Washington National Law School.

D. W. Lord, of Massachusetts, the third assistant, is a new comer in the division, having been in it only about a year, although he has been in the Patent Office since 1893, having served in the division of mills, motors and so forth, for some time. He is a Harvard man.

C. N. Anderson, the fourth assistant, is a Mississippian, a Bachelor of Science of the Agricultural and Mechanical college of his State, and a Master of Law and of Patent Law of the Columbian Law School. He is a member of the bar of the District.

A. L. Russell, fifth assistant, is from far away Texas. He is a graduate of the State Normal School of New York.



had to be assigned to other divisions, boots and shoes, harness, hose and belting still remaining in Division XI. Later on all methods of and machines for manufacturing leather from hides and skins were also assigned to another division.

To the nailing and pegging machines used in the shoe making art, were recently added machines for nailing and stapling generally, constituting the class of Nailing and Stapling. This has added to Division XI quite a line of important machines.

Among important advances in shoe making machinery are comparatively recent improvements in lasting machines and in lasts. The lasting oper-

but so far they do not appear to have been entirely successful, owing to the facility with which the skirts of the fair sex catch in anything not entirely flush with the surface of their shoe.

Another idea that has been worked out of late years is the rubber heel, designed to take up the jar to the base of the brain caused by continual walking over brick and stone pavements. The idea is an old one, but the variations are very numerous. There are now heels made entirely of rubber, that look exactly like leather and take a polish like it; there are rubber lifts that are inserted at the most effective parts of the heel, and there are rubber cushions—some of them pneumatic—



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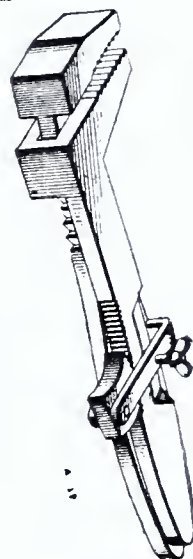
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## Utilizing Furnace Gas.

Vice-Consul-General Hanauer, of Frankfort, writes: On October 30, representatives of the largest iron works in France and Belgium visited the Horde Mining and Rolling Mills Association, at Horde, Prussia, to inspect the electrical motors for utilizing the gas from the furnaces. This new method is considered one of the wonders of modern technics. At present, three twin motors run by this gas supply power and light for the Hermann rolling Mills.



# Inventive Age

AND PATENT INDEX.

Established 1889.

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WASHINGTON, NOVEMBER, 1900.

## New Use for Chrysanthemums.

A new use for chrysanthemums is the manufacture of insect powder from their blossoms. The powder is said to be very efficacious in the extermination of certain small insects. These flowers are cultivated largely in Dalmatia, and tons are sent out of the country every year, to be manufactured into powder in France and Germany.

## Nettle Fibre Spinning.

Nettle fibre is being used for spinning in Germany, and it is asserted that it produces a tissue finer than that made from any other vegetable fibre. The nettle fibre is imported from China where the industry has long been practiced in a small way. Some 15,000 spindles and 500 men are employed in this work in Germany, and, it is said, efforts will be made to establish plantations in the German colonies in Africa and elsewhere, in order to produce the raw material on an extensive scale.

## X-Ray Cooling Tubes.

According to an English electrical journal, various methods have been provided for cooling tubes used in the production of Roentgen rays. A recent device brings the water into direct contact with the anti-cathode. A wide tube of platinum is soldered directly into the glass tube; its end is cut at an angle suitable for carrying the anticathode, sealing the tube hermetically at that end. The other end projects outside the tube, which is bent outward and carries at its extremity a flask of water. This new device is said to have proved of great practical value.

## Road Through the Patent Office.

A petition to Congress has been prepared which is being signed by a large number of business men, asking that 8th street, northwest, be cut through from F street to G street by constructing an archway through the Patent Office building. One of the purposes to be served by this improvement is the relief of the present congestion of traf-

fic during business hours at the west and east ends of the building, which is two blocks long. It is pointed out in the petition that no engineering difficulties will be encountered.

## A New Match.

An important invention in match making is claimed by a couple of Swedish engineers, who have manufactured a match said to be entirely free from poison, which has the advantage, like the phosphorous match, of being ignitable against any unprepared surface, and possesses besides resistance to dampness. The inventors claim that the matches will light even against window glass, and that they have been soaked in water for 15 minutes, and could be lighted immediately afterwards as easily as when dry. The cost will not be higher than for ordinary matches. Samples will be placed upon the market very soon.

## Prize for Rice Drying Machinery.

The Agricultural Unions of Novaro, Vercelli and Mortara, Italy, have opened an international competition for a rice drying plant, the apparatus giving the best results to receive a prize of \$1,600. Applications for admission should reach "La Direction du Comice Agricole de Novare" by March 1, 1901, and must be accompanied by drawings, models, illustrated descriptions, and particulars as to the consumption of fuel, output per hour, etc. A special jury will meet in May to select the apparatus to be submitted to practical tests. This must be at the offices of one of the above named unions by September 1, 1901.

## Molten Wood.

Vice-Consul-General Hanauer, of Frankfort, writes as follows, to the State Department: "Molten wood is a new invention by Mr. De Gall, inspector of forests at Lemur, France. By means of dry distillation and high pressure, the escape of developing gases is prevented, thereby reducing the wood to a molten condition. After cooling off, the mass assumes the character of coal, yet without showing a trace of the organic structure of that mineral. This new body is hard, but can be shaped and polished at will; is impervious to water and acids, and is a perfect electrical nonconductor. Great results are expected from this new discovery."

## Trade-Marks in Denmark.

Consul J. C. Freeman writes from Copenhagen that in order that an American citizen or firm may get a trade-mark registered in Denmark, it is necessary, as a preliminary step, that the same trade-mark be registered in the United States. There must be furnished; (1) A power of attorney signed by the petitioner, whose signature must be authenticated by a Danish consul in the United States; (2) An official extract from the United States register showing that the mark has been registered in the United States; (3) Two electro blocks, one mounted on a metal base, not larger than four inches by six; (4) Six prints of the mark on strong white paper.

The requirements in other Scandinavian countries are nearly the same as for Denmark.

## Photographing by Star Light.

Dr. William R. Brooks, of Geneva, N. Y., it is reported, has succeeded in photographing objects solely by the light from the planet Venus. The experiments were conducted within the dome of the observatory, so that all outside light was excluded except that which came from Venus through the shutter of the dome. The time was the darkest hour of the night after the planet had risen, and before the approach of dawn. The action of the light from Venus was much stronger than anticipated, the photographic plates being remarkably clear, intense and fully timed. The experiments will be continued every clear night.

## Electricity on German Farms.

Consul Hughes, of Coburg, says: "In this and neighboring parts of Germany, considerable attention is being paid to electrical appliances that can be used on the farm. Near Ochsenfurt, in Bavaria, a company composed of land owners and small farmers has been organized for the establishment of an electrical system for use on their farms and in villages. The power is to be generated by steam and water and the current to be distributed from a central station to the places at which it is wanted. Substations are to be established at given points, with the necessary apparatus for connecting with the farm or other machinery and also for lighting purposes in the houses, offices, roads and village streets."

## Improvement in Union Fabrics.

German newspapers describe a new fabric, intended for use in making garments, or as a superior class of lining. In making union fabrics, it has heretofore been the custom to bring the wool as much as possible to the upper surface of the cloth, and to hide the cotton on the back. The new cloth has a surface almost entirely of cotton with a wool backing. It is mercerized under tension in the usual way, and the result is a cloth of silky lustre without puckers, as the wool lying beneath the mercerized cotton acts as a tensioning medium, stretching and smoothing out any folds or creases which may form in the surface. This fabric may be varied by the addition of silk to the cotton, in the form of stripes, figures, and the like.

## Invention for Locating Fires.

The Pearson thermostat is receiving considerable attention in the English press. It is described as an ingenious fire alarm, the plan being to place these thermostats in various parts of a building, connect them by electric wires to a transmitter code box at the entrance, which in turn communicates automatically with the fire department. Should a fire occur in a room containing one of these instruments, the heated air would affect the sensitive thermostat (which is merely a specially constructed thermometer) and an alarm bell is rung, the number of the room being recorded on an indicator placed in a prominent part of the building.

It is claimed that this invention will lower insurance rates, as it gives greater security against fire, and also that it has already been introduced into post offices and large establishments in Great Britain, and that Northampton, Manchester and other cities are experimenting with a view to its general adoption.

## A Man's Brains His Own.

An interesting case has just been before the courts in England, in which a workingman sought to obtain damages from his former employers. It seems that he had been working for them for thirty-five years. Last year, he invented a cross winding apparatus, to be applied to mules. He made a model and submitted it to his employers, who said it was of no use. However, he perfected the arrangement, and applied for patent. He wrote his employers that if they cared to pay half of the cost of the patent fees, he would give them half share in the patent. The firm was annoyed by the letter, and said that all patents should be taken out in its name, and unless the man apologized for his letter he would be dismissed. He declined to apologize, and dismissal followed. Being an elderly man, he has been unable to find fresh employment, and as he was working for the firm under a five year contract (begun last year) he claimed damages. The defendants contended that the plaintiff was bound to give the whole of his skill and time to them, and to make their machinery as perfect as possible. The plaintiff said he was not paid by the defendants for inventing, but for attending to the mules. The court awarded the plaintiff the damages claimed.

## A Talking Clock.

From the regularity with which patents are issued for new devices in clockwork it would seem that there must be a steady market for novelties in that line. The latest device is for a combined clock and phonograph, from which, every fifteen or more minutes, a voice is made to issue announcing the time. The inventor, who is a Chicago man, and therefore naturally modest, strangely neglects to call attention in his claim for a patent, to the wonderful extension of which his idea is capable. For instance, it might be set to call, at eight o'clock, say: "Here, you, get up out of that bed, you lazy good-for-nothing fellow." Again, at dinner time, it might announce the fact: "Hash, hash, hash. All hands come to hash!" At eight in the evening, it might say, in tender, winning tones: "Now, little one, go to bed for manna like a good boy."

With proper handling, it might easily become a sort of animated memorandum book. Each night, the tasks for the next day might be spoken into a cylinder, which would call them out at the proper moment the next day. Wives might load it with admonitions: "Don't forget to match that sample." "Have you mailed that letter yet?" "Don't be late for dinner," and so on. But similar uses will occur to anyone with a grain of imagination in his composition.



## INVENTIVE LIONS.

BY

CRITTENDEN MARRIOTT.

"I was reading somewhere the other day," said the professional inventor, taking advantage of a lull in the conversation, "that animals really possessed great inventive talent. 'There is the bird, for instance', said the article, 'which invented flying—a thing no man has yet succeeded in doing; there is the bee, which invented the exact shape of cell that packs the most compactly; there is the wasp, which makes as fine a paper as man has ever been able to do; and there are many more equally ingenious animal inventors.'

"If I had been able to see the writer of that article, I could have given him an instance of inventive reasoning even more remarkable than any of those he mentioned. Perhaps you may know that I was in South Africa some years ago, at the time when Cecil Rhodes was just beginning the northward course which has now ended with the absorption of the Transvaal. He had organized a force of troopers and pioneers who had crossed the Crocodile River and swarmed over Mashonaland, driving back the Matabele, who claimed sway over it, and filing on all the gold claims that existed—and on a good many that did not exist at all. I went into the country at the same time, but by another route, landing on the coast of the Indian Ocean at a place called Beira, and going west with a hunting wagon party. We had several wagons, each drawn by sixteen oxen after the Boer fashion, and the trouble they gave us was a plenty.

"About one hundred miles inland, it became evident that our course was to be barred by a range of hills, and that we must find a pass if we wanted to get across them. So the rest of the party went off to seek for one, leaving me with one companion in charge of the wagons. That night I suppose we didn't keep good watch, for when we woke up the next morning, every one

of our native carriers had left, each carrying away a lot of our goods with him. After consulting, my companion took the only rifle we had and started out to find the rest of the party and notify them of what had happened. The result was that when night came on, I was entirely alone, with no weapon but a tiny revolver, and no companions but the sixteen oxen.

"It didn't like it a little bit and made up my mind that I would not sleep on the ground that night. A few yards away stood a dead tree, which had been broken off some thirty feet above the ground. It was easily climbed, and near the top it had two strong branches, to which I could swing my hammock. I climbed this tree, carrying up a saw to trim off the branches a little. Afterwards, I hung this on a twig at the top—a simple act, but one that saved my life.

"About midnight I was awakened by an awful roar. I gazed down. The camp was lighted bright as day by the vivid African moon, and I saw below me no less than five huge lions strolling about. Three of our oxen were down with the tawny beasts tearing their flesh. The rest had broken away from their fastenings and fled into the night.

"I was frightened at first, but soon realized that I was safe up there in the tree and began to think of revenge. I drew that little fool revolver from my pocket and fired at the biggest lion of them all. I never hit anything before and never have since, with that pistol, but I did it that time. The lion gave a short roar of rage and looked around for the person who had used him so shamefully. The other lions came up and examined the wound and loudly expressed their indignation. Then they all gathered around my tree and looked up at me in a particularly annoying way. Safe though I knew myself to be, I could not help shivering a little at their implacable expression.

"After awhile they put their heads together and the wounded one seemed to be making them a speech. When he got through they all roared in con-

cert, and I couldn't help feeling that they were vowing vengeance against me. Then they all started away and I felt a sudden hope that I was to be left alone.

"But I was soon undeceived. About thirty feet away from me stood another tree, or rather stump. It was some fifty feet high, and was studded from top to bottom with the remains of large branches. It was dead, and looked as if about to fall. Beyond this the lions walked and formed in a sort of line. The wounded one was at the head. He faced toward me, bounded along the ground for a hundred feet or so, and then, springing high into the air, threw himself with all his weight against the dead stump. He struck it some fifteen feet above the ground, making it quiver and creak. It did not fall, however, and the big lion dropped to the ground. Following came another, and another, and another, each hurling himself against the tree, as high up as he could spring.

"Of course you see what they were trying to do. They meant to force the stump to fall over against my tree and then to run up its inclined surface and be upon me in a flash. They had chosen their direction well, for if the stump fell it would catch exactly in the crotch of a big limb on my tree, and I should be gone. My life depended on that dead stump holding out.

"It did hold out splendidly, and at last the lions seemed to give up their efforts. They gathered together for a moment, and then started on a new tack. The dead tree had been kept from falling principally by a large root that extended almost directly away from me, in a direction that enabled it to exert its greatest powers of resistance to the springs of the lions. It lay partly on the surface and was partly buried, and my heart sank within me as I saw the lions form in a double rank along its course and start to dig it up.

"Then I knew the end was near. Deprived of that root, the stump would fall at the first assault. Suddenly an idea entered my head, and I grasped

the saw that was hanging beside me and started to saw through the limb against which the beasts were trying to throw the stump. They looked up at the sound of the saw and seemed to realize what I was doing, for they redoubled their efforts to loosen the root. The branch was half sawed through when they stopped their digging and backed away for a spring. The big lion again took the lead. Swish! he came through the air, striking the stump a heavy blow quite twenty feet from the ground. He clung to it tightly as it reeled, leaned forward and fell, slowly at first, but with swiftly increasing rapidity. Crash! it came against the limb of my tree, and the next second the whole string of lions was swarming up its side.

"But the sawing was nearly done, and as the stump struck the limb the latter yielded and broke beneath the weight, and stump, lions and all went down in a heap together, while I clung to the remainder of the tree top with a white face and trembling limbs and a deep sense of thankfulness at my escape.

"The lions evidently knew when they were beaten, for they gave a disgusted roar and deliberately turned tail and walked away. Three hours later the exploding parties came back. But our oxen were gone, and five of the party were ill with fever, and we had to give up the trip. That's all."

"All, is it?" responded one of the listeners. "Well, I've always heard that you were a professional inventor and now I believe it. But I won't say what you are an inventor of!"

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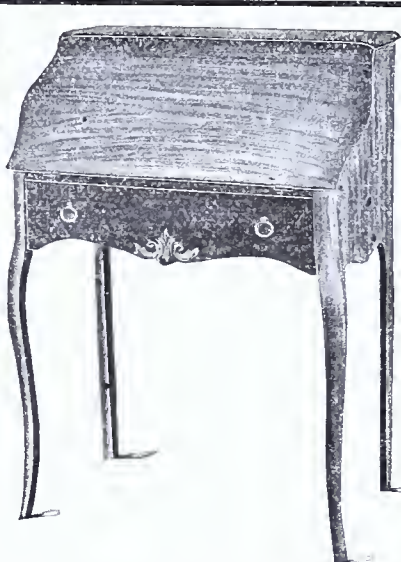
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## MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been recently procured through the Patent Soliciting Department of E. G. SIGGERS, Washington, D. C.

William T. Hatten, Canyon City, Oregon, Pipe Wrench.—The main shank is provided with a fixed jaw and has two loops, one of which is stationary, and the other pivotally connected thereto. The movable jaw has a shank which is slidably mounted in these loops. The pivot loop forms a clutch upon this shank so as to prevent its movement when the jaw is locked upon the pipe. The device is very simple and forms a powerful wrench.

Samuel Narkinsky, Little Rock, Arkansas, Fan.—This invention consists of a standard upon the lower part of which is mounted a transverse shaft having at one end an operating handle, while the other is connected by a spring with a foot treadle. This transverse shaft is geared to a vertical shaft that extends longitudinally within the standard to the top, and is connected there to a suitable rotary fan, which may therefore be operated either foot or hand power.

Henry F. Schoppe, Jefferson, Iowa, Chimney Cap.—This cap is made of two sections, one of which fits within the flue and has a flange that rests upon the top of the chimney. The other section is bolted to the first-named section and has a projecting collar adapted to receive the lower end of a pipe extension. This not only protects the upper end of the chimney, but also provides means for attaching an extension pipe.

Michael Shires, Spring Mills, and John Kennedy, of Johnstown, Pa., Fire Escape.—A rolled flexible ladder is housed within a casing which is fastened to the wall of a room just below the sill of a window. The casing can be easily opened and the ladder thrown from the window, automatically uncoiling in its flight, and providing a simple and efficient means for escaping from an upper story room should a fire occur in the building.

Addison T. Wentworth, Bedford, Iowa, Addressing Machine.—This is a hand machine adapted to apply addresses to envelopes, newspapers, letters, and all printed matter to be sent through the mails. It comprises a machine so constructed as to provide simple means for running out a paper strip containing the names and post office addresses in successive order, pasting the strip, severing the individual labels and stamping them upon the mail matter to be addressed. It then automatically resets itself for the next name, the whole operation being accomplished by manipulating the machine as in ordinary hand stamps.

Franklin W. Craig, Marion, Va., Grain Separator.—This separator has a shaking shoe, composed of a frame and a sectional upper screen made of foraminous material with meshes of different size. Transverse and longitudinal partitions are secured to the frame above the screen, and a lower screen is fixed below the sectional screen and the fine meshed screen fabric. Means are provided for regulating the inclination and the shaking movement of the shoe so as to vary the rate of feed through the same.

Albert J. Asher and William A. Gault, Round Rock, Texas, Car Compeller.—A pair of jaws are pivoted within a drawhead, and a pair of operat-

ing levers are mounted upon the outer corners of the car. The operating levers are connected to crank arms by means of rods. The crank arm operates upon the jaws to throw them into and out of operative position when the levers are thrown one way or the other by the trainmen.

Alexander G. Duncan, Ryan, Iowa, Grocers' Cabinet.—The purpose of this device is to provide a receptacle for containing paper bags and rolls of wrapping paper, in which they will be protected thoroughly from dirt and dust. It comprises a casing having enclosed shelves for the reception of different sized bags, with novel means for permitting the removal of one at a time, and an enclosed base in which the rolls of wrapping paper are placed. This base is divided with hinged covers under which the paper passes, the edges of the covers being sharpened to present a knife edge against which the paper can be torn.

Earl Sherwood, Honesdale, Pa., Car Fender.—This is a decided improvement in the art. It comprises a construction which is readily adjustable to different sizes and heights of cars, and can be readily detached from one end and applied to the other. The frame itself is of a strong but light construction, and there is novel mechanism provided for setting and dropping the fender.

Charles F. Suider, Mt. Pleasant, Iowa, Binding Device.—This invention is for the purpose of temporarily binding deposit tickets, vouchers, and similar papers, and comprises an extensible clamp post of two members, with novel means for securing them in properly adjusted position. The tickets or papers are placed between these clamps and are held there by suitable pins.

Walter R. Thacher and Nathan W. Hussey, Oskaloosa, Iowa, Cow Milker.—An ordinary milk can is provided, the top of which carries an air pump, and a vacuum gage which indicates the amount of air extracted therefrom. From this can leads a pipe having at end a suitable cut-off valve, and at the other a novel mechanism to be applied to the cow. The device is very simple and inexpensive.

Alvin Anthony, Stull, Pa., Saw Handle.—The feature of this invention resides in the novel manner of fastening the handle to a crosscut saw. It consists substantially of a clamping plate fitting on the handle and provided with a groove to receive the edge of the saw blade. A clamping bolt passes through the plate and handle, being screw-threaded at one end, and having enlarged flattened jaws at the other which embrace the saw blade. This forms a very secure and rigid fastener.

John C. Enoch, Mount Sterling, Ky., Box Cover Fastening.—The principal idea of this invention lies in a fastener for connecting the cover and body of leatheroid and similar lunch boxes. The opposite edges of the box are provided with metallic strips having projecting tongues. The corresponding edges of the cover have similar strips which are provided with sockets in which the tongues of the body portion are adapted to lock, and thus hold the cover securely on the box. This does away with straps and similar fastenings on the exterior of the box.

William Handler, Jerseyville, Ill., Strainer Attachment.—This invention is adapted to be placed within a beer dispensing apparatus to equalize the amount of froth or foam supplied by each glass, and consists of a tubular casing having a closed perforated end,

and a series of longitudinal slots or curves extending into the same from its opposite end.

Ambrose F. Jackson, Rock Island, Illinois, Pipe Wrench.—This wrench will operate upon any round or regular object, and will automatically release and renew its grip. A spring is provided and arranged in such manner that it will exert a pressure on one of the jaws in the right direction and urge the jaws toward each other and effect proper engagement between them and the pipe. A further improvement resides in providing a bearing face for the pipe which is pressed simultaneously with the gripping action. Crushing and mashing between the jaws is thus avoided.

William E. Karns, Parker's Landing, Pa., Oil Well Pumping Apparatus.—In this construction the wear of the pump is evenly distributed throughout the bore of the cylinder, so that when the enlargement thereof has reached such a point as to render the packing ring of the plunger inoperative, the said plunger may be fitted with an interchangeable set of packing devices of larger diameter adapted to fit the enlarged bore. The introduction of the plunger with the packing devices is accomplished with facility and without danger.

Henry C. Laverv, West Superior, Wisconsin, Life Preserver.—This is an exceedingly ingenious device and comprises a small receptacle, which may be pinned to and carried by a person, and which contain suitable chemicals which, when they come in contact with the water, form a gas and expand a rubber bag carried. When a person carrying one of these devices is thrown into the water, the latter, combining with the chemicals, forms the gas, expands the bag, and keeps the person afloat.

James H. Redfern, Bay Mills, Mich., Manicure Instrument.—This instrument comprises a pair of handles which carries two co-acting cutting jaws, each having arcuate working edges standing transversely to the handle. Means are provided for regulating the distance between these edges. This enables the finger nails to be trimmed in a artistic manner, and also provides a pair of tweezers and a scraper. A suitable keeper holds the handles and jaws closed when not in use.

Greenville H. Rood, San Antonio, Texas, Spark Arrester.—A horizontal plate, whose front end has an upwardly curved extension, is supported within the smoke box and engages a flue sheet above the flues on the side of the smoke box. Another plate is pivoted within the smoke box above the horizontal plate and to the rear of its curved extension. This plate is adapted to be rocked, so that it will rest upon the upper edge of the curved extension or be in engagement with the top of the smoke box. This construction permits of a large exhaust nozzle, and prevents the escape of any live cinders. Full heating surface is given at all times, and an increased draft is obtained.

William Sullivan, Cincinnati, Ohio, Feeding Device for Printing Presses.—This is an attachment specially designed for feeding open-flap envelopes to the printing mechanism of an envelope printing machine. It consists of a support adapted to be carried by the usual feeding mechanism, and a straight supporting blade arranged on the support. Movable with this supporting blade, and arranged at one side thereof is a separate curved feed arm. This blade and feed arm are adjustable to suit different sized envelopes.

Samuel Waters, Warren, Pa., Lawn Trimmer.—This is an improvement on a prior patent. Instead of the usual rotating knives, a reciprocating cutter is provided, operated by novel means, which extend up the handle and are adapted to be operated by the person using the device. The construction is much simpler than that set forth in the former patent.

Sam Harbison, Knoxville, Tenn., Design for a Wrench.—The leading feature of the design resides in a shank provided at opposite ends with approximately U-shaped heads or jaws, each of which is provided on its opposite inner sides with a series of alternating V-shaped notches and lips, the oppositely arranged lips and notches lying in a common transverse plane. This forms a simple little device that may be applied to nuts of various sizes.

Felice F. Maloney, Sudbury, Canada, Design for a Combination Pocket Article.—The device comprises a cigar shaped flat-sided body, having within its plane a series of teeth forming a cam which extends longitudinally along it. This simple little device forms a paper cutter, a comb, and a nail cleaner.

John C. Bell and John Bell, Harveyville, Kansas, Draft Equalizer.—The object of this invention is to provide a construction whereby three or more draft animals may be hitched to a wagon so that the draft will be equally distributed upon each animal, and without casting any side draft upon the tongue. An evener is pivotally mounted upon one end of the double-tree, and a singletree is on the opposite end and on the evener. An intermediate singletree is provided and a flexible connection is made between the intermediate singletree and the evener, whereby a reverse movement is imparted to the evener when a forward pull is given to the intermediate singletree.

Thomas M. Dils, Davenport, Iowa, Wardrobe.—The object of this invention is to provide a folding collapsible and extensible structure which may be compactly folded for storage or transportation, and readily set up in position for use. It is adapted to be suspended from a wall or overhead support, and comprises a flexible folding back, with an extensible bow at or near the top of the back, which consists of kerfed overlapping slidable sections, and a canopy or cover which embraces the sections. Besides being a wardrobe it is well adapted for use as a canopy.

Richard E. Hall, Grady, Arkansas, Colter Clamp.—This device comprises a pair of clips pivotally connected at their central portions and having their ends bent substantially at right angles. The ends of one arm are screw-threaded to form bolt ends, and are adapted to be placed respectively in front and behind the colter and project across and engage the plow beam. A retaining plate connects the screw-threaded bolt ends, and nuts are screwed thereon to hold the device and colter securely in place. This forms an extremely rigid fastening device.

Samuel Nicholls, Kenesaw, Nebraska, Invalid's Bed.—This provides a very simple construction adapted to promote the comfort and convenience of the occupant. It may be readily applied to ordinary bedsteads, and comprises means for holding the several parts in position, so that the patient may, without fatigue, be raised and held in a sitting posture.



**A** CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE, which keeps inventors and manufacturers posted in the art in which they are mostly interested.—The full address of any patentee, and number of patent found below sent to any address on receipt of one 2-cent stamp.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings upon receipt of 10 cents per copy; twenty copies for \$1.50.—Address THE INVENTIVE AGE PUBLISHING CO., 918, F St. N. W. WASHINGTON, D. C.

## LIST OF PATENTS

GRANTED FOR INVENTIONS.

ISSUED OCTOBER 9, 1900.

Acid. Making sulfuric.....A. C. Johnson  
Acid. Meta-amidotoxyloxaminosulfo.....2 pats  
Adjustable table.....H. S. Jordan  
Air compressing apparatus. Hydraulic.....W. O. Webber  
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Baling cotton.....C. L. Bessouette  
Bath cabinet.....J. V. Elliott, et al  
Bearing. Ball.....H. F. Weeks  
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Buckle.....J. W. Heyman  
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Dyeing.....A. Siegmund  
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Egg carton packer.....W. H. Davis  
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Electric meter.....T. A. Edison

Electric motor supporting device.....C. A. Lindstrom  
Elevator.....W. H. Mechlin  
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 Motors, Regulating.....F. J. Sprague  
 Muffler.....H. C. Thamsen  
 Musical instrument, 2 pats.....W. W. McCallip  
 Nozzle, Exhaust.....E. Deatherage  
 Nozzle, Hydraulic.....W. A. Doble  
 Nut and bolt lock.....E. C. Guerrant  
 Nut-cracker.....E. P. Sedgwick  
 Oil-can, Lamp-filling.....A. Kitterman  
 Ore washer and separator.....E. W. Eaton  
 Ores, Treating telluride.....2 pats.....C. J. Head et al  
 Oxalates, Making.....M. Goldschmidt  
 Package.....F. Knobeloch  
 Packet, Folded and sealed.....L. C. Crowell  
 Packing-machine.....T. L. Camp  
 Paper box, Knockdown.....A. F. Warner  
 Paper from straw, Mfg.....L. K. Bohm  
 Paving-tool.....F. A. Hotherington

Pen, Fountain.....L. Hooker  
 Pen, Fountain.....C. J. Renz  
 Penholder, Fountain.....S. M. Salisbury et al  
 Pendulum-beat adjuster.....S. B. Parker  
 Permutation-lock.....J. H. Livingstone  
 Phonograph, 3 pats.....G. W. Gombor  
 Phonograph, Coin mechanism for.....G. W. Gombor  
 Photograph-entire.....E. B. Nicholson  
 Photograph-exposure meter.....C. W. Brown  
 Photographic-printing frame.....W. Hndson et al  
 Pictures, Shutter for apparatus for exhibiting animated.....E. L. Doyen  
 Pipe-bending machine.....W. E. Morris  
 Pipe-boiler.....C. D. Casad  
 Pipe-cleaning apparatus.....V. Bonzagni  
 Pipe-coupling.....S. R. Dresser  
 Pipe-holder.....C. Rohlfis  
 Pipe-threading machine.....L. F. Carstensen  
 Planer.....G. W. Stetson  
 Planetarium.....J. M. Jones  
 Planter and fertilizer-distributer.....G. W. Snipes  
 Planter, Corn.....J. A. Chambers  
 Planter, Seed.....W. L. Wright et al  
 Plaster.....W. G. Thatcher  
 Plate-lifter.....J. Kindschuh  
 Portmanteau-frame.....W. F. Smith  
 Powder, Composition for blasting.....G. Bencke  
 Powder-insufflator.....W. F. Barry  
 Power-transmitter.....C. W. Richards et al  
 Press.....F. Grote  
 Propelling mechanism.....C. M. Palmer  
 Propeller, Boat.....A. Belz  
 Pulp washer and strainer.....L. K. Bohm  
 Pump.....J. G. Baker  
 Pump and compressor, Air.....G. Sipp  
 Rail-connector.....E. H. Bryant  
 Rail-joint.....J. Crites et al  
 Railway-rail anchor.....C. Rahmgren  
 Railway-sleeper.....H. Jassoy  
 Railway turn-table.....J. S. Stephens  
 Razor, Safety.....E. E. Deputy  
 Rear sight, Adjustable.....T. C. Johnson  
 Rein-guide.....W. A. Rhodes  
 Rifle, Air.....W. J. Burrow  
 Rolling machine, Iron.....T. J. Jones  
 Rolls.....R. B. Charlton  
 Rotary engine.....J. P. Baxter  
 Rotary engine.....W. Lambert  
 Rotary motor.....W. J. Cruyt  
 Rotary-piston motor.....F. W. Jaeger  
 Roving can, basket, or box.....G. S. Perkins  
 Sad-iron.....T. C. Edwards  
 Saddle, Harness.....S. P. Martin et al  
 Salt-cellar.....W. H. Moore  
 Sash, Reversible window.....F. C. Dunn  
 Sawbuck attachment.....T. J. Johnson  
 Saw-cabinet.....J. F. Hunsie  
 Saw, Drag.....W. A. Miller  
 Sawmill attachment.....H. M. McCaskill  
 Sawmill set-works, Electric.....W. M. Carroll  
 Scale.....W. F. Stimpson  
 Sealing tins, Means for hermetically.....J. R. Croft  
 Seed delinter, Cotton.....W. C. Baxter  
 Seeder, Grass.....N. McPherson  
 Sewing-machine needle.....H. A. Blanchard  
 Shaft-coupling.....C. W. B. Putnam  
 Sheet-feeder.....S. K. White  
 Sheet-metal pipe.....H. A. Marlin  
 Sheet-metal wheel.....R. Chillingworth  
 Shipping-box, Wooden.....E. H. Barnes  
 Ships from sinking, Preventing.....A. Wysgalla et al  
 Sifter, Flour.....W. M. Viser  
 Sign.....C. S. Sergeant et al  
 Signaling apparatus, Train air.....J. H. Turbush  
 Siphon.....C. F. Haynes  
 Smokeless furnace, Automatic.....F. Wild  
 Snap-hook.....J. F. Mitchell  
 Soap-holder attachment.....C. A. Weller  
 Sodium, Persulfate of.....A. Lumiere et al  
 Stacker, Hay.....C. Blackwell  
 Staining, Ornamental.....B. Burriss  
 Stamp-battery mortar.....W. A. Merralls  
 Steam boiler.....D. Ahern  
 Steam-boiler.....L. Charnois  
 Steam-boiler.....J. Mallet et al  
 Steam-engine.....H. Jensenius  
 Steam-engine.....C. C. Worthington  
 Steam-generator.....F. E. Stanley et al  
 Steam-generator.....R. H. White  
 Steering apparatus.....C. L. Rogers  
 Sterilizing apparatus.....E. von Buhler  
 Stove, Camp-cooking.....W. C. Landy  
 Stove, Heating.....A. B. Hower  
 Stove, Hot-blast.....E. Vorbach  
 Strainer, Milk.....F. Hoyl  
 String-fastener.....C. E. Moore  
 Stubble-burner.....R. Ireland et al  
 Stud and scarf-holder.....J. Pancke  
 Support, Universal.....C. E. Cook  
 Switch-operating device.....H. B. Pierre  
 Switch-shifting mechanism.....W. Hamilton  
 Tablet, Writing.....M. J. Green  
 Talking-machine, 4 pats.....G. W. Gombor  
 Taps, Constructing high-pressure water.....W. Bradley  
 Telephone-exchange system.....W. M. Davis  
 Telephone-exchange system.....J. L. McQuarrie  
 Telephone-switch.....A. Stromberg  
 Telephone-switchboard pilot-signal.....C. E. Scribner  
 Telephone system.....W. M. Davis  
 Telephone-transmitter.....G. B. Perkins  
 Telephone trunk-line signal.....H. M. Crane  
 Tent.....T. D. McCall  
 Thermometer case, Clinical.....A. F. Blagdon-Richards  
 Thill-coupling.....J. Marvin  
 Thread-cutter.....D. N. Jerald  
 Ticket, Identification.....J. R. Cavanagh et al  
 Time-alarm, Electric.....S. Wolf  
 Tire, Pneumatic.....R. P. Scott  
 Tire, Rubber.....A. W. Grant  
 Tires, Valve for pneumatic.....E. W. Holt  
 Tires in construction, Air-extractor for pneumatic.....A. E. Ellinwood  
 Tool, Combination.....C. I. Still et al  
 Toy.....C. Pemberton  
 Toy.....J. J. Reed  
 Toy rooker.....G. S. Kerr

Trace hook and guard.....T. A. Bakken  
 Traction-engine.....G. F. Conner  
 Traction system.....F. J. Spragne  
 Traction wheel.....G. F. Conner  
 Transformer, High-frequency.....C. P. L. Noxon  
 Transformers, &c. Testing.....A. R. Everest  
 Transporting device, Rotary.....G. Possien et al  
 Treads, Makink non-slipping.....F. W. Huestis  
 Trestle.....M. Miller  
 Trolley system, High-potential.....W. B. Potter  
 Trolley-wire-suspending device.....W. A. McCallum  
 Truck, Car.....W. E. Symons  
 Truck-guard.....T. Proulx  
 Trunk, Wardrobe.....L. Goldsmith  
 Truss.....D. D. Dennis  
 Truss.....W. S. Miller  
 Tube-adjusting device, Vacuum.....T. B. Kinraide  
 Turbine, Steam.....D. Kemble  
 Turret-tool.....C. L. Goodrich  
 Type-holder.....A. Elliott et al  
 Type-writer.....R. J. Miner et al  
 Type-writer, Pneumatic.....M. Soblik  
 Type-writer's chair.....F. Chichester  
 Valve-gear.....L. A. Lang  
 Valve-gear.....H. Lentz  
 Valve-governor, Automatic.....D. C. Streeter  
 Valve, Hot-blast.....D. Baker  
 Valve, Steam-engine rocking.....F. L. Ezell  
 Vapor-burner for steam-generators.....F. E. Stanley  
 Vehicle-brake.....C. R. Grenter  
 Vehicle-spring connection.....P. L. Jones  
 Vehicle-spring-gear.....D. Trne  
 Vehicle-wheel.....W. H. Schofield  
 Vehicles, Short-turning gear for.....W. B. Green  
 Vessel, Means for scraping.....P. Wisdom  
 Wagon-brake, Automatic.....J. H. Poulter  
 Wagon, Coal-delivery.....D. M. Pfantz  
 Washbench, Folding.....W. A. Arrowsmith  
 Washboiler, Attachment.....D. E. Anthony  
 Washing-machine.....W. A. Grant  
 Washing-machine, Rotary.....L. C. Hartsough  
 Washing piece goods, Apparatus for.....E. Remy  
 Watchcase-spring.....W. Colley et al  
 Watch-crystals, Lathe-chuck for grinding.....A. R. Weaver  
 Water-closet flush.....J. Bowman  
 Water-motor.....J. Sands  
 Water-trough.....J. C. Tucker  
 Water-wheel, Impact.....J. R. De Remer  
 Wave-motor.....2 pats.....G. N. Todd  
 Weighing and counting machine.....W. H. Sanderson  
 Weighing-machine.....J. Manes  
 Weighing-machine, Automatic.....G. Hoepner  
 Weighing-machine dial-face.....L. W. Baldwin  
 Weight-motor.....U. J. Fuhrman  
 Well jack, Oil.....R. W. Hudson  
 Wheat-separator.....R. B. Gentle  
 Wheels, Antislipping attachment for.....B. K. Appleman  
 Wheels, Machine for mfg sheet-metal.....E. Williams  
 Writing-pad.....E. H. Schind

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Adding-machine.....A. Hoch  
 Adhesive composition and making same.....W. V. Carter  
 Advertising-automaton.....C. T. Bradshaw  
 Alarm.....E. Straton et al  
 Annealing and oxidizing metal plates.....B. R. Parr et al  
 Assorting-case, Portable collapsible.....M. S. Field  
 Awl, Sewing.....H. U. Bradt  
 Axles, Sand-shield and truss for.....H. Keller  
 Band-cutter.....J. S. Manly  
 Battery plate, Storage.....E. A. Sperry  
 Bearing, Ball.....S. W. Bull  
 Bedstead.....B. R. Blaisdell  
 Bedstead-fastening.....A. S. Myers  
 Bolts, &c. Shifter for.....G. W. Pearce  
 Bicycle.....C. H. Metz  
 Bicycle gear, Compound.....H. Dyer  
 Bicycle-gearing.....C. H. Metz  
 Bicycle-mud guard.....A. B. Olmsted  
 Bicycle-pump, Self-supporting.....R. N. Hatch  
 Bicycle-saddle.....O. S. Harmon  
 Bicycle-saddle body.....A. F. Meisselbach et al  
 Bicycle seat-post.....J. B. Weir  
 Bicycles, &c. Seat for.....E. W. Walker  
 Blower, Rotary.....E. P. Reichheim  
 Boat, Collapsible.....J. Gutknecht  
 Boiler.....P. W. Hanford  
 Boiler.....S. Lancsces  
 Boiler safety device, Steam.....J. H. Bullard  
 Bolt spring-fastener.....S. C. Ball  
 Bookbinding.....J. McGraw  
 Book-rest, Adjustable.....C. W. Davis et al  
 Bottle.....J. B. Tanveron  
 Bottle-capping machine.....C. G. Bauer  
 Bottle, Dentifrice.....C. G. Hilgenberg et al  
 Bottle for liquids or gases under high pressure.....G. Clarke  
 Bottle-stopper.....J. R. Dice  
 Bottle-stopper.....J. Kowsky  
 Bowling-alley, Portable.....A. J. Rollert  
 Boxes, cards, &c. Supply for.....G. D. Snell  
 Brick-machine.....2 pats.....W. P. Grath  
 Brick-press.....H. Horton  
 Buckle.....W. P. Gelahert  
 Building-block.....A. J. Delke  
 Bulkhead and door.....J. H. Hind  
 Button.....E. W. Silsby  
 Cable-roads, Sheave for.....L. Frohnert  
 Calcium-carbid cartridge.....G. G. Smith  
 Calling apparatus, Individual.....W. F. Homman  
 Can-filling machine, 2 pats.....J. E. J. Goodlett  
 Car-coupling.....C. E. C. Edey  
 Car-coupling.....S. Geoghegan  
 Car-coupling.....A. E. Mills  
 Car-coupling, Automatic.....J. Edwards  
 Carbon-sheet holder.....F. A. Bartelmez  
 Carburetor.....W. A. Schmidt  
 Carriage, Convertible.....E. R. Briggs  
 Carriage-shifting device.....H. E. Payne



Cartridge-clip. Temporary. T. C. Johnson  
Casting-making apparatus. W. W. Doolittle  
Catamenial appliance. C. A. Moberg et al  
Cattle-guard. W. Evans et al  
Cell. Thermo-electric. 2 pats. E. F. Yost et al  
Cement-and-steel construction. F. Melber  
Cesspool or drain. Floor. J. Tucker  
Chart. Adjustable. W. R. Williams  
Cheese-cabinet. C. C. Brown  
Chuck. W. J. Parsons  
Churn. J. M. Goss  
Churn. W. A. Johnston et al  
Churn. W. B. Mitchell  
Churn. O. A. Morrow  
Churn-dasher. E. R. Franklin  
Churn-operating means. W. H. Le Sner et al  
Cigar-making machine. G. W. A. Hankey  
Circuit breaker. Automatic. W. B. Watzel et al  
Clay-pipe-molding die. M. J. Bannan  
Clock. Program. A. J. Reams  
Clock. Self-winding electric. A. J. Madden  
Clutch. B. C. Ball et al  
Coke-oven. E. A. Babbage  
Collapsible closet. H. M. Fessenden  
Collar. Apparel. H. J. Scraten  
Color-card. Dyer's. P. S. Clarkson  
Condensing apparatus. Portable. J. D. Lance  
Conveyer. G. W. McCaslin  
Cooking-utensil lid. M. E. Konkle  
Cotton-press. W. T. Bessonet  
Couch. C. F. Thayer  
Cover holder. Vessel. G. Gordon  
Crane. Soaking-pit. S. T. Wellman et al  
Crank-paddle. H. A. A. Martens  
Crucible-shaker. 2 pats. W. S. Mather  
Cultivator. W. S. Graham  
Cultivator. Corn. S. D. McGuire  
Cultivator-hoe. Spring. M. K. Noaker  
Curtain-fixture. C. B. Titus et al  
Cuspidor. M. Weinberger  
Cycle. Motor. G. D. Green  
Cyclist's back-support. W. C. Humphrey  
Dental cuspidor. H. J. Tarr  
Dental plugger. R. Blum  
Detrick. Portable farm. G. Wenzelmann  
Die-press. E. W. Silsby  
Dish-cleaning apparatus. A. Rosedale  
Disinfecting apparatus. C. Freese  
Display-rack and sample-case. Combined wall-paper. E. C. Pithian  
Door-check. A. Arens  
Dowel-pin. Tile or brick. O. C. Pixley  
Drafting implement. Tailor's. A. N. Rosenbloom  
Drawer. Money. S. C. Anderson  
Dry-pan. E. Smith  
Drying-kiln. A. Anderson  
Drilling-machine. A. J. Gifford  
Dyeing apparatus. N. L. Smith  
Ear. Apparatus for treating. R. Watson  
Egg-beater and churn. J. M. C. Jones  
Electric battery. F. K. Irving  
Electric brake. F. E. Case  
Electric circuits. Safety cut-out for. J. Sachs  
Electric-machine slot-wedge. Dynamo. H. G. Reist  
Electric machines. Regulating dynamo. C. P. Steinmetz  
Electric meter. T. A. Edison  
Electric-motor wheel. C. E. Ishills  
Electric regulator. C. W. Richards  
Electric-shock machine. Coin-controlled. B. M. Davis  
Electrical-distribution system. C. I. Young  
Elevator and carrier. E. C. Berghoefer  
End-gate. C. S. Wright  
Engine. L. S. Holmes  
Engine. Petroleum internal-combustion. G. H. Rogers  
Engine shut-off mechanism. T. D. Miller  
Engines. Distributing mechanism for steam or other fluid-pressure. C. Bonjour  
Engines. Gasifying apparatus for explosive. F. Durr  
Etching metal. C. Mueller  
Farm-gate. W. Braden  
Farm gate. B. A. Fisher  
Fastening eye. Garment. E. M. Lesser  
Faucet. N. H. P. Francis  
Feed-water regulator. C. B. Edwards  
Fence-machine. G. W. S. Bell  
Filter. W. Dorval  
Firearm. Breech-loading. F. Hochbrunn  
Firearm cover. C. Candian  
Firearms. Safety triggers and hammers. J. Kalina  
Fire-hose nozzle. B. C. Crane  
Fireproof door. J. W. Rapp  
Fireproof window. J. C. McFarland et al  
Firing-shovel. H. W. Crowther  
Folding-machine. A. M. Fletcher  
Folding-machine. Rotary. W. Spalekhafer  
Fruit box or basket. H. O. Little  
Fruit-packing form. S. L. Casella  
Fuel. Apparatus for feeding fine. H. B. Pruden  
Furnace. J. Murphy  
Furnaces. Automatic air-feeding apparatus for. F. Pinther  
Furnaces. Tool for charging plates into. P. C. Patterson  
Furniture swell front. F. O. Anderson  
Fuse-igniter. J. T. Nagle  
Fuse. Safety. J. Sachs  
Gage. C. F. Winslow  
Game-recorder. W. H. Levings  
Garment-hanger. J. Shoenberg  
Gas-burner. Incandescent. G. W. Seebach  
Gas generator. Acetylene. A. P. Keller et al  
Gas generator. Acetylene. G. G. Smith  
Gas-meter. Prepayment. C. Whitham et al  
Gas-washer. J. F. Swinnerton  
Gate-spring. J. L. Gross  
Gearing stop mechanism. Spur. W. I. Whitehurst  
Glue and by-products. Making. L. L. Kelsey  
Governing engines. Apparatus for. E. A. Sperry

Grain-drier. G. Werner et al  
Grain-securer. O. A. Shonbeck  
Grain-separator. J. B. Pedrick  
Grapppling-iron. P. F. McClintick  
Grinding-machine. M. W. Neuen  
Gun-barrel. W. S. Evans  
Guns. Elevating and ramming apparatus for barrette. A. T. Dawson et al  
Guns. Machine for loading feed-belts for machine. J. M. Browning  
Guns. Shell extractor and ejector for breakdown. P. W. Southgate  
Hair cutter and comb. G. W. Anderson  
Halter. E. B. Evans  
Harvester. Cotton. A. Levedahl  
Harvesting-machine. 2 pats. W. H. Traphagen  
Hat. Apparel. A. L. Johnson  
Heater. K. J. Foley  
Heater. J. E. Frost  
Hoisting apparatus. F. E. Herzog et al  
Hoof-pad. M. Hallanan  
Hoof-pad retainer. W. F. Waite  
Hop-drier. A. Wolf  
Horse-blanket. C. H. Carli  
Horseshoe-calk. J. Thane  
Horseshoe. Soft-tread. E. B. Evans  
Hose-clamp. J. Bunte et al  
Hose-coupling. D. Smith  
Hub. Ball-bearing. P. F. Schaffer  
Hydraulic-apparatus safety device. P. Lambert  
Hydraulic motor. W. C. Trussell et al  
Hydraulic press. G. A. Sauer  
Ice-cream freezer. S. C. Horn et al  
Incandescent bodies. Mfg. R. Langhans  
Incandescent-mantle support. T. S. Fuller  
Incubator. O. W. Randolph  
Indicator. C. L. Clarke  
Injector. N. B. Dodge  
Insulating electric conductors. Reissue. N. Tesla  
Insulating-knob for electric-light wiring. R. H. Henderson et al  
Insulator. C. Alley  
Ironing machine. Edge. W. H. Ricker  
Jaw wrench. Sliding. J. H. Flanagan  
Journal-bearing. J. D. McKee  
Keyhole-guard. Combination. C. E. Plinder  
Knitting stockings. H. G. Huettig et al  
Knob attachment. H. Lomax et al  
Knobs or picture-hanging nails. Device for fixing screw-stems in. S. Kribs  
Kryolith. Treating. C. A. Doremus  
Lace tip. Shoe. G. L. Benson et al  
Lamp. Carbureting. J. C. Peden  
Lamp. Electric-arc. J. J. Rathbone  
Lamp. Incandescent oil. J. C. C. Read  
Lamp receptacle. Incandescent. P. H. Fielding  
Lamps. Manufacture of incandescent electric. W. L. Voelker  
Last. P. B. Abbott  
Last. J. E. Tilt  
Latch. M. Sutton  
Latch. Gate. G. W. Randall  
Latch. Gate. L. M. Smyth  
Lath-tool. F. O. James, Jr  
Ledger. Perpetual. C. V. Heukel  
Letter-box. A. L. Henry  
Life-preserving float. S. German  
Life-saving corset. C. O. Dutton  
Lift. Telescopic. C. O. Bullock et al  
Lifting-jack. J. T. Harbin  
Lightning-arrester. C. J. Reed  
Linotype-machine. Electric. A. W. Storm  
Liquid-drawing apparatus. 2 pats. J. Nagelinger  
Liquid-separator. Centrifugal. D. H. Burrill  
Lock. J. J. Treat  
Locomotive. W. P. Henszey  
Loom. A. Insinger  
Loom-reed. W. F. Luther  
Lozenge-cutting machine. F. P. Rosback  
Mail-bag catcher and deliverer. S. G. Preston et al  
Mains. Branch connection for water. 2 pats. H. H. Burritt  
Mangle. L. J. Lindbeck  
Mantle-support. G. O. Miller  
Mat-cutter. C. C. Dunkel  
Match composition. J. Craveri  
Match-dipping machine. C. J. Anderson et al  
Match-igniting composition. J. Craveri  
Mattress or cushion. Air. A. H. Sawtell  
Merry-go-round. E. P. Schmitt  
Metal bending or curving machine. J. N. Gibson  
Microscope. R. L. Fucile  
Milling-machine. G. Richards  
Mining-machine. J. Herzler et al  
Molds. Apparatus for drawing patterns from. J. H. B. Bryan  
Mop-wringer. L. W. Richardson  
Motor-control system. A. S. Garfield  
Mower. O. L. Ervin  
Mower attachment. Lawn. L. W. Pelletreau  
Music-leaf turner. R. Hammond  
Musical-instrument tone-modulating device. E. Klaber  
Neckband-shaper. E. A. Grant  
Necktie-retainer. J. C. Watson  
Nut-lock. E. R. Post et al  
Oat-grader. F. E. Walsh  
Ordnance Manufacture of. J. A. Potter  
Ore-leaching apparatus. 2 pats. J. A. Fleming  
Ore-separator. J. P. Smith  
Ores. Treating refractory. J. C. Teller  
Overflow-alarm device. A. Fasig  
Package. F. A. Bartelmez  
Package-filling carrier. G. R. Wyman  
Packing. Gland. J. Walker  
Packing. Piston. C. F. Rigby  
Padlock. Combination. T. P. Owen  
Panel-board and fuse-holder. C. J. Klein  
Pedal-clutch mechanism. E. Klaber  
Pencil-holder. F. Hayes et al  
Penholder. J. V. Washburn  
Photograph sound-box. F. Myers  
Photochromoscopic apparatus. F. E. Ives  
Photographic-background carrier. J. F. Newell  
Photographic objective. P. Rudolph  
Photographic-plate holder. R. E. Reardon  
Photographic shutter. L. J. Vogt

Piano. G. B. Durke  
Pipe-riveting machine. S. Foreman  
Pitcher-cover. Removable ventilating. A. Drennan et al  
Plastering composition. J. C. McMillin  
Plate-holder. Magazine. C. L. Bouton  
Plate or pan lifter. J. F. Neal  
Plow. J. N. Hanna  
Poultry. Housing for. J. Ingram  
Powder mixing mill. F. A. Halsey  
Power transmission. E. J. Berg  
Pressure-regulator. J. H. Bullard  
Propeller-shaft bearing. J. T. Shepard  
Pruning-shears. P. Broadbooks  
Pulley-block. E. J. F. Coleman  
Pulp to bottles, &c. Machine for applying wood. W. Burke et al  
Pump. J. M. Stokes  
Pump. H. Welch  
Pumping apparatus. Water. C. Anesbaensel, Jr  
Pumping or compressing gas and air. Apparatus for. J. Keith  
Punch. F. A. Peeso  
Punch-stripper. F. A. Peeso  
Rail-joint. H. M. Boyd et al  
Railway-crossing structure. W. C. Wood  
Railway-switch. Automatic. W. Schoenewald  
Railway-switch stand. Safety-signal. J. B. Colvin  
Rat-trap. J. W. Holmes  
Receptacle. C. R. Harris  
Reclining-chair. P. Charbonneau  
Reflector. Composite. W. A. Penfield  
Reflectors. Manufacture of. S. G. Cowper-Coles  
Refrigerator-pan alarm appliance. J. H. McGurty  
Reversible engine. H. P. Ogden  
Road-roller. M. G. Schinke  
Rock-drill. C. E. Young  
Rotary explosive-engine. F. G. Bates  
Rotary explosive-motor. P. H. Standish  
Sander. B. B. Jenkins  
Sash-cord fastener. G. Worth  
Sash. Window. G. W. Holly  
Satchel. H. B. Hempe  
Saw. Drag. D. Adkins et al  
Saw-gnarl. H. J. Barnard  
Saw-setting device. J. Ranz  
Saw-setting implement. C. C. Taintor  
Saw-sharpener. J. W. Green  
Seaboard. G. E. Lowman  
Sealing fruit-jars. Device for. W. Burch  
Sewing-machine thread-cutter. R. W. Thomson  
Shade cover. Window. P. W. Vandenhoff  
Shaft-support and coupling. W. E. Murbarger  
Shears. C. McSherry  
Shelf. Divisible. E. R. Storm  
Shell extractor and ejector. W. H. Gates  
Shield for use in warfare. H. M. Wells  
Shoe. G. S. Webber  
Shoe. Ventilated. C. K. Sharood  
Sign and making. Advertising. F. Tuchfarber  
Sign. Interchangeable-letter. R. B. Holley  
Signaling system. 2 pats. E. J. Silkman  
Skirt-supporter. H. A. Heinemann  
Spark-arrester. J. Blanchette  
Spigot. J. M. Carico et al  
Stacker. Hay. D. W. Hoover  
Stacker. Pneumatic. C. B. Hixson et al  
Stamping and numbering machine. J. D. Humphrey et al  
Steam-boiler. F. J. Chamro  
Steam-engine. E. Sarver  
Steam-generator combustion-chamber. T. F. Roland et al  
Stone. Artificial. S. Grossard  
Store-service apparatus. 2 pats. E. C. Gipe  
Stove-heating. H. Barber  
Stove. Heating. F. M. Reed et al  
Straw-burning furnace. H. C. Clay  
Street-conduit or subway. M. E. Dunne  
Suspenders. Folding. W. H. Boggs  
Syringe. E. E. Ertzman  
Teaching, speaking and reading. Means of. J. L. Kingma  
Telantograph. A. Pollak  
Telephone system. L. Schmidt  
Temperature in steam-heated buildings. Apparatus for regulating. A. M. Butz  
Temperature-indicator. Electric. L. S. Wilder  
Thermo-electric battery. J. Oliver  
Thill or pole coupling. Vehicle. J. G. Lamb  
Threshing-machine straw-bottom. F. F. Landis  
Ticket. Railway. G. W. Craig  
Time-recorder. Workman's. P. G. Giroud  
Tin from tin-scrap. Separating. O. Meyer  
Tire. A. E. Flatter  
Tire pressure-gage. Pneumatic. C. Lillierap  
Tire-setter. W. Daugherty  
Tire. Vehicle cushion. J. F. McGuire  
Tobacco rack and truck. F. Corbin  
Tool. Combination. W. E. Seelye  
Tooth-crowns. Apparatus for making seamless. J. F. Twist  
Tooth-straightening appliance. C. D. Lukens  
Top. Spinning. J. W. Lobb  
Toy revolver. T. H. Lewis et al  
Track-cleaner. E. Sarver  
Triangle. E. H. Waterbury  
Truck. Car. J. S. Francis  
Teuss. Hernial. J. D. Day  
Tubing from hollow billets. Apparatus for producing. J. T. Rowley  
Tug. Shaft. G. C. Klein  
Type-casting machine. G. H. Ziegler  
Type-setting machine. P. H. McGrath  
Type-writing and printing machine. E. J. Deutsch  
Type-writing machine. W. J. Barron  
Type-writing machine. F. N. Wagner  
Type-writer indicator. J. W. Shinholser  
Type-writing-machine type-bar. D. Briggs et al  
Umbrella attachment. T. Howie  
Umbrella-cover rib-clasp. C. F. Burnett  
Umbrella-strick. N. Foley  
Valve. Compound-engine. S. M. Vanclain

Valve gear. Exposure. H. A. Berman  
Valve-gear. Explosive engine. C. P. Bask  
Valve. Globe and check. C. E. L. Sizer  
Valve. Inflation. J. L. Sawle  
Valve-regulator for water-motors. D. P. Sims  
Valve. Stop. A. Turnbold  
Vapor-burner. Incandescent. J. J. Doolip  
Vehicle. T. A. Dool  
Vehicle. B. C. Hicks  
Vehicle-brake. F. G. Goettmann, Sr  
Vehicle. Motor-driven. R. J. Gelling  
Vehicle reach connection. O. Pizack  
Vehicle-running-gear. F. C. Copeland  
Vehicle. Self-propelled. R. Jackson  
Vehicle. Spring-propelled. A. R. Fischer  
Vehicle-wheel. J. C. Smith  
Vehicle-wheel lock. G. Becker  
Velocipede. Railway. J. E. Johnson  
Vessel-closing device. O. Kretschmer  
Vessel for liquids. C. Martin  
Vessels or vehicles. Controlling moving. 2 pats. B. A. Fish  
Vise. Pipe. T. Davis  
Voting-machine. S. Lo  
Wagon-body. B. Harbord  
Wagon-body and end-gate. W. F. Marquardt  
Washing-machine. P. A. Harwick  
Watchmaker's tweezers. W. G. Conn  
Water-closer flushing-tank. C. J. Ball  
Water-gate. C. H. Baker  
Water-meter disk. F. Lambert  
Water. Purifying. L. Gathmann  
Water-tube boiler. W. D. Hamilton  
Water-wheel. F. Trump  
Wax from paraffin-oil. Apparatus for separating. P. R. Gray  
Weed-puller. R. Russell  
Weeder. J. M. Essig  
Welding-tongs. Electric. J. R. Duncan  
Whistle-trill-back. N. Glock, Jr  
Windmill-lubricator. E. E. Swett  
Window. G. Worth  
Window-platform. Portable. A. H. Tischer  
Window-ventilator. S. Heppinstall  
Wire-rope and bucket-clip. B. C. Ribbet  
Work-holder and centering device. J. W. Brown, Jr  
Wrench. G. B. Carter

ISSUED OCT. 30, 1900.

Air-brake. J. E. Normand  
Amalgamator. T. H. Hicks  
Ambulance. Bicycle. H. L. Gerz  
Anchor-setting tool. J. T. Swartz  
Ankle-brace. A. J. Brauer et al  
Armatures. Spool for drum. A. Rotheri  
Atmospheric burner. T. J. Little, Jr  
Automatic gate. G. E. Riez  
Axle-box and axle connection. W. H. Matthew  
Balancing engine or motor. G. L. V. Chauveau  
Baling-press. J. S. Tuttle  
Baling-press band-tyer. W. Kennedy et al  
Band-cutter and feeder. T. Elliott  
Bandage. G. Voellner  
Banjo-bridge. F. R. Hammann  
Bearing. Adjustable. J. White  
Bed-bottom. Spring. T. J. Anderson  
Beehive bar-frame. W. Horner  
Belt. Diagnosing. F. R. Ryan  
Belt-retainer. F. H. Houghton  
Belt-shifter and tightener. R. G. Luther  
Belt-shifter. Automatic. P. W. Fryer  
Bicycle. N. M. Barnes  
Bicycle. J. E. Ruby  
Bicycle-brake. H. E. Ringle  
Bicycle-guard. J. Wambach et al  
Bicycle handle-bar. J. M. Justen  
Bicycle-tender. C. H. Stonebridge  
Bicycles, luggage-carrier. 2 pats. M. Bauer  
Binding. Brush skirt. A. W. Stockley  
Boiler. P. Cunningham  
Boiler attachment. C. Phillips  
Boiler-due. E. Seif rth  
Boiler-furnace. J. A. Stevens  
Book. Account. A. L. Pastress  
Book-signatures. Device for marking. C. T. Hermann  
Box cover. Cigar or other. H. M. Kreh  
Box-lid support and tag-holder. J. H. Knowles  
Brake. C. W. Martinus  
Brake mechanism. 2 pats. J. E. Normand  
Brick-kiln. E. Aber  
Bridge. M. Waddell  
Bridle-bit. J. Purcell  
Brush-blank-holding device. W. C. Read  
Brush. Comb. A. B. Durgin  
Brush. Tooth. D. J. Archer  
Brug. Barrel. 2 pats. F. W. Pichel  
Buoying means for water-craft. J. M. Richens  
Burial apparatus. J. Carhart  
Burial-case machine. M. L. Keyes  
Butter, &c. Apparatus for making molds of. R. E. Webb  
Button. 2 pats. D. A. Carpenter  
Cake-making machine. Striped. W. C. Barber et al  
Calorie-engine. J. T. Nicolson  
Candle-holder. M. Haagen  
Candlestick. Miner's. F. Herbst  
Candy-machine. T. J. Jenkins  
Car body-bolster. Railway. E. W. Palmquist  
Car buffer. Street. P. M. Kling  
Car-coupling. J. Kelso  
Car-coupling. W. M. Conway  
Car-coupling. W. S. Owen  
Car-coupling. C. Schlare  
Car-door fastener. H. Pries et al  
Car door. Grain. J. Clarke  
Car fender. Street. H. Furstenau  
Car fender Trolley. L. Madas  
Car-loader. H. P. Harpsrite  
Car-seat foot-rest. P. M. Kling  
Car-track-brake. Railway. E. L. Lowe et al  
Car-wheel. I. Hogeland  
Cars, &c. Supporting-strap for. L. T. Yoder  
Carbon. Manufacturing. H. Wartenberg  
Carbonating apparatus. Liquid. A. Wall  
Carpet-stretcher. L. M. Townes



Case and chair. Combined...H. Flanders  
Chain and wheel. Drive...J. C. Pratt  
Chain. Sheet-metal...F. E. Vanderbush  
Chain-tightener...H. Green  
Chair...E. E. Koken  
Chalk-line holder...J. A. Vernon  
Chimney-cowl...J. Clarkson  
Cigarette-machine...J. Moonelis  
Cleaning surfaces under water...P. Mason  
Clod-crusher...J. Schoeller  
Clutch. Fluid...P. Cunningham  
Clutch. Fluid...J. T. Ryther  
Coat. Apparel...F. G. Dodshon  
Cock or faucet. Self-closing...F. H. Stahl  
Coffee. Preserving roasted...S. Feitler  
Coffee. Ripening...T. R. Timby  
Coffin-handle...M. G. Wheeler  
Coin-controlled mechanism...P. P. Cox  
Collar and necktie fastener...H. B. Barnes  
Commutator-truing device...P. B. Bosworth  
Compressor. Single-cylinder compound...T. Grant  
Confectionery-depositing machine...G. Carlson  
Conveyor and elevator. Electric...G. K. Fischer et al  
Cooking appliance...E. Jurgens  
Copper, gold, or silver. Hardening and tempering...D. E. Conner et al  
Corn-shredder...F. Hagan (Reissue)  
Cotton-gins. Metallic brush for...J. H. Jenkins

Cultivator...A. Taplin  
Cultivator. Listed-corn...E. F. Cheney  
Current generator. Single-phase alternating...B. G. Lamme  
Damper and spark-arrester...F. T. Bowling  
Decorating. Mechanical device for...H. Hall  
Delivery mechanism...S. Wheeler  
Dental remedies. Preparing...H. Bauermeister  
Dish-washer...F. S. Hogg  
Draft-arm. Double-stream...J. Armerod  
Draw-heads. Automatic uncoupling for...J. T. Lee  
Drilling-machine...O. E. Oakes  
Driving mechanism...P. Cunningham  
Dumb-bell and Indian club...D. J. Kennedy  
Dye. Blue sulfur...H. Gussmann  
Electric accumulator...H. Weymersch  
Electric conduits. Appliance for making metallic connections between...A. W. Watkins et al  
Electric contact device. Screw...C. Chevallier et al  
Electric currents. Amplifying...J. B. Baker  
Electric-distribution system...E. M. Hewlett  
Electric indicator...C. L. Clarke  
Electric motor...R. G. Lamme  
Electric motor. Variable speed...T. S. Watson  
Electric-snap-switch cover...M. Gueth  
Electric switch...C. H. North  
Electrical conductors. Varying active lengths of...C. F. Scott  
Electrical-distribution system...B. G. Lamme  
Electrical switch. Rotary snap...M. Gueth  
Electricity-meter...P. Elbig  
Electrode. Arc-lamp...F. Hachmann  
Electrogalvanic battery...H. J. Brewer  
Elevator emergency stop or brake...I. Frankel  
Engines, &c. Fuel vaporizer and mixer for explosive...A. Hayes  
Engines. Mixer and vaporizer for gas...J. W. Lambert  
Engines. Sparking-plug for explosive...E. T. Birdsall  
Engraving-machine...W. S. Eaton  
Excavating apparatus...W. Henderson  
Expansion-bolt...I. Church  
Explosive charge...E. Gathmann  
Fan. Electric...J. T. Beswick  
Fan. Ventilator...A. W. Metcalfe  
Fare-registers. Mechanism for...J. F. Ohmer et al  
Fastening device...J. T. Conn  
Feed apparatus. Automatic...J. S. Beeman  
Feed-water regulator...A. Cruickshanks et al  
Feeder. Stock...J. J. Singley  
Fence...D. Sheets  
Fence-post...A. Reitenour  
Fertilizer-distributor...A. Taplin  
File-box...W. E. Dunning  
File-box...W. W. Huelster  
File. Newspaper or letter...H. P. Krebbel  
Filter for wines, &c...G. Peraud  
Filters. Anti-freezing...L. K. Davis  
Fire-escape...J. Derus  
Fire-escape...E. S. Gail  
Fire-escape...J. O. Miller et al  
Fire-escape...W. H. Newman  
Fire-escape...L. Weber  
Fire-extinguisher. Chemical...A. P. Prier  
Flies. Building device for...C. S. McConnan  
Flower. Illuminated...W. A. Church  
Flower-stand...K. M. Jennings  
Flue. Sectional...E. A. Bell  
Flushing device. Sanitary...A. F. Blesch et al  
Folding collars, &c. Machine for...J. Temple  
Foot-warmer...H. Hermans  
Forging fork-headed rods. Die for...W. L. Jones  
Fruit-clipper...N. B. McGhee  
Fruit-picker...W. G. Sayrs  
Fuel. Artificial...F. C. von Heydebrand et al  
Galvanizing apparatus...W. A. Leonard  
Game. Coin-freed...E. G. Matthews  
Garter...G. H. Blakesley  
Gas apparatus. Air...C. W. Miller  
Gas-burner...T. E. Simberg  
Gas machine. Acetylene...J. M. Coghlan  
Gas-meter. Prepayment...J. Zander  
Gas-releasing bit...W. Bush  
Gases. Utilizing liquefied...A. Kreuster  
Gate...H. Alten  
Gear and clutch. Reversing...C. W. DeMooy  
Glass-making apparatus...D. C. Ripley et al  
Glass. Manufacture of prism...2 pats...D. C. Ripley et al  
Glass-working machine...J. J. Burkhardt  
Gown. Nursing...R. Coyle  
Gun-barrels. Rifling...C. J. Hamilton et al  
Gun-sighting apparatus...H. A. von Kretschmar et al

Guncotton-press...A. Hollings  
Hammer. Tooth-stopping...C. Ostmann  
Harvester-conveyer...H. Brackbush  
Harvester. Corn...J. C. Fry  
Harvesting-machine reel...H. Brackbush  
Hasp-lock...P. C. Greenawalt  
Hat-brim trimmer...M. Levy et al  
Head-rest. Adjustable...J. E. Waterbury  
Header and thresher...C. L. Correll  
Hoist, winding-gear, &c...J. C. Howell  
Hoisting apparatus...R. R. Raymond  
Horse-detacher...T. Sanders  
Horseshoe. Soft-tread...W. J. Conway  
Husking-peg...L. Bishop  
Hydrant...E. Cronstedt  
Impression-cylinder...O. Roosen  
Incandescent element...C. G. Richardson  
Incubator...J. W. Myers et al  
Incubator...C. S. Wilson  
Induction-motor. Alternating...B. G. Lamme  
Infant's chair...E. Pirnhuber  
Ingot-manipulator...A. T. Keller  
Ink-pad stand...E. G. Woody  
Instrument-table for opticians, &c...P. S. Reid  
Insulating support for switchboard-conductors...G. Wright et al  
Jigging machine. Slime...C. B. Rogers  
Key-bar...G. H. Irish  
Kilns. Machine for coaling or slackening ballast...J. B. Faulkner  
Knitting machine...H. A. Klemm  
Lace fastener. Shoe...A. E. Kroeninger  
Lacing hook and fastener...L. J. Buehsieb  
Lamp. Acetylene-gas...C. W. Jackson  
Lamp. Bicycle...L. C. Johnson  
Lamp. Electric-arc...C. E. Harthan et al  
Lamp. Incandescent gas...R. Beese  
Lamp mantle. Incandescent...W. H. A. Sieverts  
Lampblack. Making machine...J. F. Sanders  
Lath. Coach...A. Ochsner  
Lath-centering device...J. G. Obermier  
Lathe. Crank-pin-turning attachment...A. Tindel et al  
Letter-box...C. E. Knight  
Level. Bob...F. Sinkovics  
Lever. Equalizing...J. E. Normand  
Lock...B. Phelps  
Lock...C. C. Spengler et al  
Lock and burglar-alarm...S. Ritchie  
Lock strike and alarm...W. I. Entwistle  
Locomotive...W. W. Gregg  
Locomotive-boiler...F. Burger et al  
Locomotive cabs. Deflector for...G. C. Zang  
Loom fringe-pulling device...T. Rowcroft  
Loom heddle mechanism...T. Rowcroft  
Loom jacquard mechanism...T. Rowcroft  
Loom shuttle-positioning mechanism...A. B. Edmonds  
Looms. Let-off motion for...C. B. Bennett  
Magnetic signal...C. H. North  
Magneto-electric generator...C. H. North  
Mail receiver and deliverer...A. L. Henry  
Manual-training apparatus...J. E. Kelly  
Match-box...B. von Eigen  
Measuring instrument...F. Schrottko  
Measurer for alternating currents...K. O. F. Schrottko  
Mechanical motion...F. Lambert  
Metal-bending machine...W. E. S. Strong  
Metal-depositing apparatus...H. R. Boissier  
Metals. Deoxidizing...E. Ehrenberger  
Metallic tie...H. M. Muntz  
Minerals and slimes. Device for collecting finely-divided...W. E. Darrow  
Motor-compressor cooling means...J. T. Nicholson  
Mount for natural-history specimens...O. Strimpell  
Mowing and reaping machine...C. Whitney  
Mowing-machine hinge-joint...J. F. Steward  
Music-leaf turner...J. M. Duplanté  
Music-sheet turner...J. B. Williamson et al  
Musical box...G. Varrelman et al  
Musical instrument. Pneumatic...M. Clark  
Nail...J. G. McGaughey  
Nozzle. Hydraulic regulating...W. A. Doble  
Nozzle reducing-cap...G. J. Carlisle  
Nut-cracker...2 pats...G. L. Thompson  
Nut-cracker...C. C. Tombs  
Nut-lock...L. C. Shammo  
Objective...E. Bausch  
Offset device...O. Roosen  
Oil-leak-forming apparatus...E. C. Bisbee  
Oil-extracting apparatus...2 pats...E. Maertens  
Oiling device...V. H. Ernst  
Ordnance. Perforated powder rod for...E. Gathmann  
Ore-roasting hearth...G. Clary et al  
Oven. Bake...J. Bour  
Paper. Manufacture of...J. H. Annandale  
Paper-pulp. Screen-plate for straining...E. J. Welch  
Paraxanthin and making same...F. Ach  
Partition...H. W. Bell  
Peant-vine stripper...F. W. Bowen  
Pen. Fountain...W. C. Sherman  
Pencil-holder and letter-balance...O. Beckmann  
Pessary...H. M. Paine  
Picture-adjuster...D. W. Tower  
Pictures. Mounting...M. L. Cowan  
Pipe and nut wrench...M. D. Converse  
Pipe-coupling...L. D. Lovekin  
Pipe-coupling for pneumatic tools...H. G. Kotten  
Pipe-cutter...W. F. Norman  
Pipe-wrench. Reversible...R. J. Northam et al  
Plane...M. D. Converse  
Plansifter...H. Rose et al  
Planter...J. Colby  
Planter...S. G. Sparrow  
Planter and cultivator...S. G. Svensen  
Planter. Corn...B. Cox  
Plate-forming machine...R. G. Holbrook et al  
Plow cotton-scraper attachment. Turning...J. W. Page  
Plows. Frame-lifter for disk...W. P. Hendon  
Pneumatic tool...H. J. Kimman  
Pneumatic tool...H. G. Kotten  
Post-hole digger...G. A. Freer  
Potato-digger...L. A. Aspinwall

Printed webs. Folding and inserting...H. Hartt  
Printing-machine guide...O. Roosen  
Projectile for ordnance...B. E. L. DeMare  
Pulley. Rope...E. L. Wagner  
Pulley. Sash...J. Duffy  
Pulp. M'fg articles from...J. M. Leaver  
Pulp-refining engine...J. J. Foley  
Pump. Rotary reciprocating...V. E. Emgarth  
Pumping. Apparatus for...T. Butler  
Purse or bag frame...B. von Eigen  
Quinin and caffeine. Making soluble compounds of...A. Kreidmann  
Race-horse-starting machine...C. W. Crowley  
Rail-joint...S. G. Miller  
Rail-joint...D. Stephens  
Railway appliances. Actuating device for...2 pats...E. A. Sperry  
Railway-switch-locking device...C. Sulfer  
Railway-switch-operating mechanism...W. Warneke  
Railway system. Electric...B. E. Osborn  
Railways. Third rail for electric...B. C. Seaton  
Rand-trimmer shield...E. E. Angell  
Rasp-cutting machine...J. Turner  
Razor. Device for holding safety...F. Kampfe et al  
Refrigeration apparatus...O. Guthrie  
Rendering fats...A. von Podewils  
Rice-drill...L. W. Haskell  
Rock-drills. Pneumatic hammer for...W. D. Jones et al  
Roll relief device...C. Kuhlwind  
Rolling-mill...C. Kuhlwind  
Roofing. M'fg corrugated felt...P. Knoch  
Rope-grip...R. C. Gardner  
Rotary engine...G. C. P. Andersson  
Rotary engine...D. Morell  
Rotary engine...C. I. Williams  
Runner attachment...W. C. Oswald  
Salve-box...A. C. Taylor  
Sampling, averaging, mixing, and storing. Apparatus for...T. A. Edison  
Saw...D. B. Johnston  
Saw. Drag...J. H. Perkins  
Saw-machine...J. Wurster  
Saw-mill feeder. Band...L. J. Hanhart  
Sawmill set-works...S. W. Butterfield  
Saw motor. Drag...C. P. Hellyer  
Scale. Automatic weighing...E. Hanak et al  
Scraper. Cotton...F. N. Renfrow  
Scribing-tool...W. Lipsy  
Seal. Car...S. F. Estell  
Seeding-machine disk-shoe...J. Morphy  
Sewer-inlet grating...W. T. McLam  
Sewing and cutting machine...B. Bissinger  
Sewing-machine. Overseaming...H. A. Klemm  
Sewing-machine. Overseaming...O. R. Van Vechten  
Sharpener. Meat-grinder-knife...R. V. Jones  
Sharpening attachment. Disk...H. H. Hunniet  
Sheaf or bundle register...J. F. Young  
Sheet-metal can or box...G. Miller  
Sheet-metal-forming die...E. G. Budd  
Shield or breastwork. Roller...R. S. Anderson  
Shield for protecting soldiers...A. Hitt  
Shingle-sawing machine...J. W. Seavolt  
Shoe blacking device...L. M. Bryan  
Sieve cleaner. Shaking...W. D. Gray  
Sifter. Ash...C. J. Wowra  
Signal-box. Non-interference...F. W. Cole  
Skate...H. S. Evans  
Skirt-supporter...E. E. Dyer  
Soap. Apparatus for making rosin...F. Arledter  
Soap cutter and separator...J. J. Gaynor  
Sorting means...P. J. Zehnder et al  
Spinning apparatus. Yarn...J. C. Edwards  
Spinning or twisting apparatus. Yarn...6 pats...M. E. Sullivan et al  
Spoke, tire, and felly tightener...H. Meyer  
Square. Try...D. S. West  
Stacker-hood. Pneumatic...A. A. Russell et al  
Sake-holder...J. Cowan  
Stamp pick-up and affixing device...D. P. MacLaurin  
Steam-boiler...J. A. Stevens  
Steam-engine...J. Davidson et al  
Steam-engine...C. A. Ruckel et al  
Steam-trap...E. E. Parker  
Steel. Determining hardening heat for...E. Childs  
Stencil-sheet for autograph apparatus...K. Walter  
Sterilizing-case...J. G. Mastin  
Stove...P. M. St. Louis  
Strainer. Tea or coffee pot...J. P. Eustis  
Stripping device...G. H. Allen  
Strip. Dress...G. Wilson  
Tapping-machine...O. Mueller  
Telephone-call recorder...H. D. Strond  
Telephones, &c. Hygienic resonator for...G. Hoglund et al  
Telephonic apparatus...R. Gunther  
Telephone for use on vessels...M. R. D'Asar  
Testing-machine. Centrifugal...E. Bausch et al  
Tether-ball...L. Bissell  
Thresher. Pea...A. J. Johnson  
Tiles. Making...F. K. Cheese  
Tiles. Manufacture of pasteboard glazed...H. Miralles y Angles  
Tillage-machine...F. H. P. P. Oram  
Tire. Bicycle...N. Swanson  
Tire-setting machine. Rubber...W. S. Brooks  
Tire. Vehicle...G. L. Allen  
Toe-clip...O. W. Kuley et al  
Tool. Electric machine...J. Riddell  
Tool-holder...F. W. Roebbel  
Toy...F. B. Holder  
Treeing-iron...W. E. Davis  
Triple-action jack...E. E. L. Boyer  
Trolley-track...F. J. Richard  
Trousers-guard...C. L. Tripp  
Truck. Car...J. C. Barber  
Truck. Car...C. M. Carnahan

Truck. Car...G. G. Floyd  
Truck running-gear...E. Whalley  
Truss...J. Fandrey  
Tube-cleaner...H. F. Weinland  
Turnstile...P. M. Kling  
Type-writing machine...E. W. Brackelsberg  
Type-writing machine...J. Felbel  
Type-writing machine...B. C. Stickney  
Unicycle driving mechanism...H. A. Boes  
Vacuums. Producing high...J. W. Howell  
Valve...H. H. Troxel  
Valve. Double-seated...C. F. Murray  
Valve for water-chambers of liquid-forcing apparatus. Shnt-off...H. Stauff  
Valve. Pressure regulating...P. B. Taylor  
Vehicle-brake...O. V. Bachelie  
Vehicle-brake...H. Magee  
Vehicle-gear. Low-down short-turn...M. O. Wickes  
Vehicle-wheel...S. H. Van Trump et al  
Vehicle-wheel. Metallic...2 pats...T. Midgley  
Vehicles. Driving and speed-changing mechanism for motor...L. Renault  
Vending machine. Stamp...J. MacKirdy  
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Work-holder or clamp.....J. Ranz

### Smoke Prevention.

The practical problem of smoke prevention has been solved, but there is still room for improvement in details, and it is well worth an inventor's while to turn his attention to the subject. A writer in Cassier's Magazine says:

"As a result of misdirected energy in trying to introduce smoke-preventing apparatus, many devices have been installed, to be operated under conditions of service for which they are totally unfitted. Some meritorious ones have been imperfectly erected or adjusted, or were ignorantly handled. Others have proved costly to maintain, or have failed to respond to fluctuating conditions. It is not surprising, therefore, that a large percentage of these so-called smoke preventers have proved to be failures, and that nearly all of them have been thrown out, at great loss to both purchaser and promoter. So discouraging was the outlook a few years ago that most manufacturers, as well as many progressive engineers, despaired of a solution, believing that there remained some particularly refractory conditions which no one of the devices on the market could fully meet.

Nevertheless, substantial progress in smoke prevention has been made.

\* \* \* To prove that the problem has now been solved, it is only necessary to point to the hundreds of smokeless chimneys in many large cities, which serve furnaces burning inferior grades of soft coal, many of them operated continuously under most exacting conditions."

### NOTE.

As the time approaches for celebrating the hundredth anniversary of the founding of the Federal City, every American who takes pride in its beauty will be greatly interested in the opening article of the December Cosmopolitan on this subject. Its author, Mr. F. W. Fitzpatrick, a prominent resident of the Capital, has the happy faculty of telling an interesting story in an entertaining way, and at the same time condensing all the salient points of Washington's history from its foundation, and presenting a bird's eye view of the many-sided life of the Capital of the United States. The Cosmopolitan has also been honored in being the sole publication chosen by Sir Robert Hart to present to the American public his article on the besieged Peking Legations, which is practically the final word on the Chinese situation.



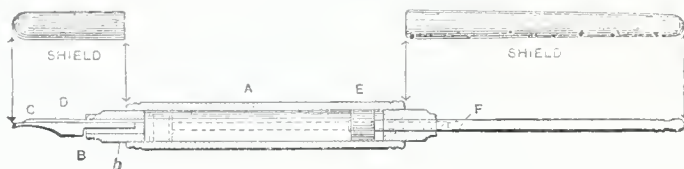
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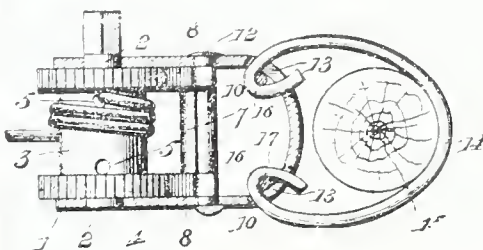
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